THE NEW!
73® Amateur Radio Today

APRIL 2001
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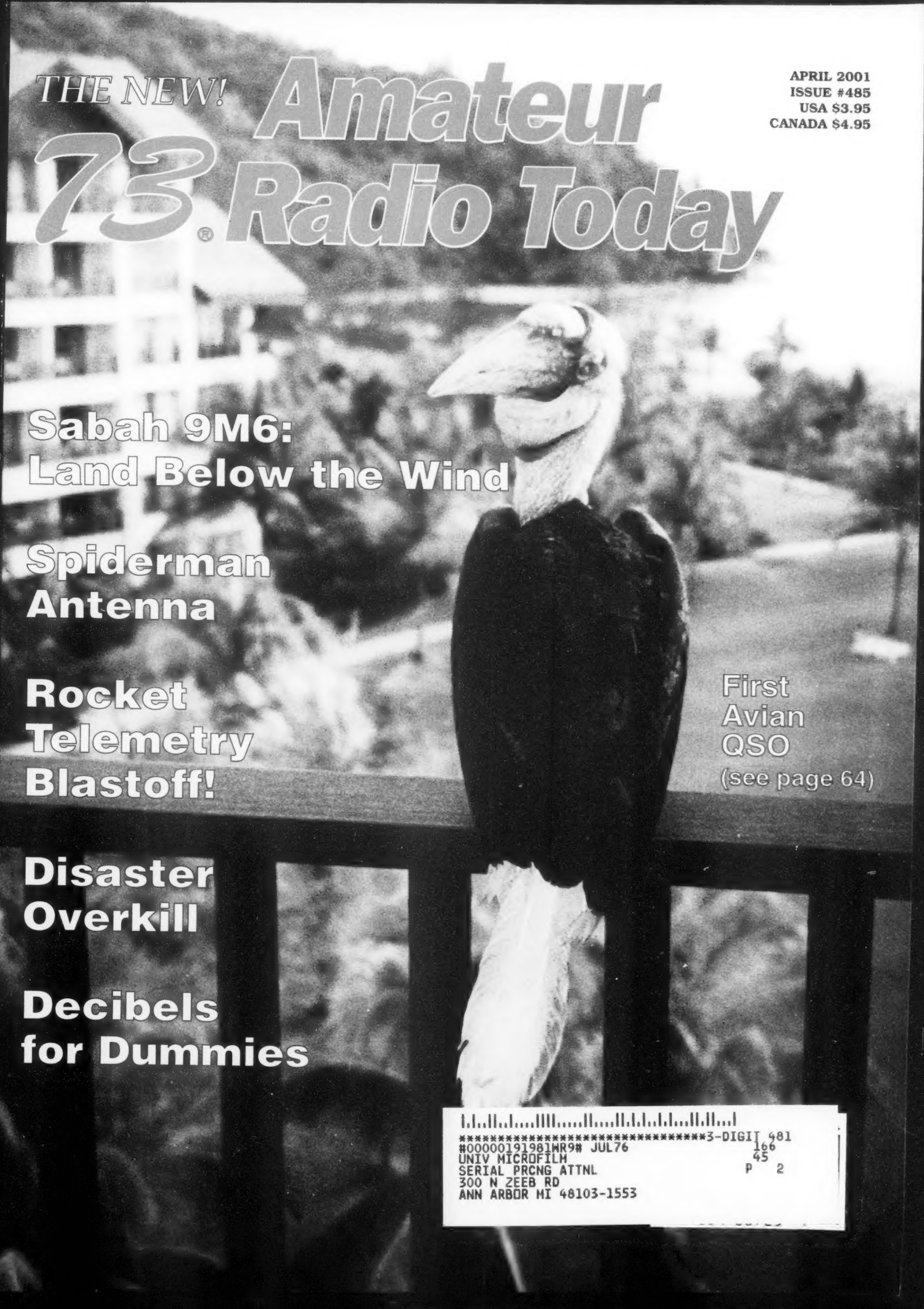

Sabah 9M6: Land Below the Wind

Spiderman Antenna

Rocket Telemetry Blastoff!

Disaster Overkill

Decibels for Dummies

First Avian QSO (see page 64)

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* Cellular blocked in USA models. Unblocked versions available for export and authorized use. ** Patent applied for. ***Accessory stereo headphones or speakers required.

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ISSUE #485

THE NEW!

73® Amateur Radio Today

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QRX . . .

ARRL Reverses Position on CW (er ... well ... kinda ... sorta ...)

The ARRL Board of Directors has partially revised its position on Morse Code proficiency.

The League's own news release said that the Board approved a resolution that both recognizes and accepts as being likely that the Morse requirement will be dropped from Article S25 of the international Radio Regulations. They even admit that this could happen as soon as the 2003 World Radiocommunications Conference. But while the ARRL leadership acknowledges that Morse will probably disappear as an international requirement, it held the line on retaining a domestic Morse requirement.

The bottom line, says the ARRL Board: Each country must be allowed to determine for itself whether or not it wants to have a Morse code requirement.

As far as keeping Morse testing here in the United States goes, the Board's resolution says that any future deletion of the Article S25 international requirement should not automatically or immediately mean a similar removal of the code tests from Part 97 of the FCC rules. Morse code, the Board says, deserves continued support as an important operating mode

Continued on page 6

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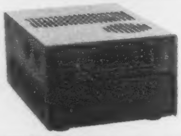
SWITCHING POWER SUPPLIES...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MODEL SS-12IF

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MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-10	7	10	1⅛ x 6 x 9	3.2
SS-12	10	12	1⅜ x 6 x 9	3.4
SS-18	15	18	1⅜ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅜	4.2
SS-30	25	30	3¾ x 7 x 9⅝	5.0

MODEL SS-25M

DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-25M*	20	25	2⅞ x 7 x 9⅜	4.2
SS-30M*	25	30	3¾ x 7 x 9⅝	5.0

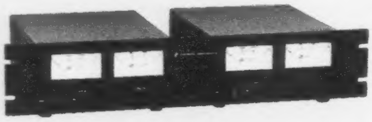
MODEL SRM-30

RACKMOUNT SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25	20	25	3½ x 19 x 9⅜	6.5
SRM-30	25	30	3½ x 19 x 9⅝	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3½ x 19 x 9⅜	6.5
SRM-30M	25	30	3½ x 19 x 9⅝	7.0


MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25-2	20	25	3½ x 19 x 9⅜	10.5
SRM-30-2	25	30	3½ x 19 x 9⅝	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3½ x 19 x 9⅜	10.5
SRM-30M-2	25	30	3½ x 19 x 9⅝	11.0

MODEL SS-12SM/GTX

MODEL SS-10EFJ-98

CUSTOM POWER SUPPLIES FOR RADIOS BELOW

EF JOHNSON AVENGER GX-MC41
EF JOHNSON AVENGER GX-MC42
EF JOHNSON GT-ML81
EF JOHNSON GT-ML83
EF JOHNSON 9800 SERIES
GE MARC SERIES
GE MONOGRAM SERIES & MAXON SM-4000 SERIES
ICOM IC-F11020 & IC-F2020
KENWOOD TK760, 762, 840, 860, 940, 941
KENWOOD TK760H, 762H
MOTOROLA LOW POWER SM50, SM120, & GTX
MOTOROLA HIGH POWER SM50, SM120, & GTX
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
UNIDEN SMH1525, SMU4525
VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

NEW SWITCHING MODELS

SS-10GX, SS-12GX
SS-18GX
SS-12EFJ
SS-18EFJ
SS-10-EFJ-98, SS-12-EFJ-98, SS-18-EFJ-98
SS-12MC
SS-10MG, SS-12MG
SS-101F, SS-121F
SS-10TK
SS-12TK OR SS-18TK
SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V

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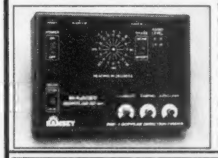
*ICS – Intermittent Communication Service

RAMSEY

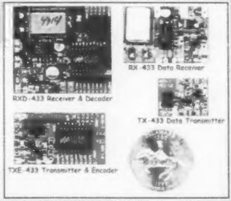
Doppler Direction Finder



Track down jammers and hidden transmitters with ease! This is the famous WA2EBY DF'er featured in April 99 QST. Shows direct bearing to transmitter on compass style LED display, easy to hook up to any FM receiver. The transmitter - the object of your DF'ing - need not be FM, it can be AM, FM or CW. Easily connects to receiver's speaker jack and antenna, unit runs on 12 VDC. We even include 4 handy home-brew "mag mount" antennas and cable for quick set up and operation! Whips can be cut and optimized for any frequency from 130-1000 MHz. Track down that jammer, win that fox hunt, zero in on that downed Cessna - this is an easy to build, reliable kit that compares most favorably to commercial units costing upwards of $1000.00! This is a neat kit!!

DDF-1, Doppler Direction Finder Kit	**$149.95**

Wireless RF Data Link Modules



RX-433 Data Receiver

RXD-433 Receiver & Decoder

TX-433 Data Transmitter

TXE-433 Transmitter & Encoder

RF link boards are perfect for any wireless control application; alarms, data transmission, electronic monitoring...you name it. Very stable SAW resonator transmitter, crystal controlled receiver - no frequency drift! Range up to 600 feet, license free 433 MHz band. Encoder/decoder units have 12 bit Holtek HT-12 series chips allowing multiple units all individually addressable, see web site for full details. Super small size - that's a quarter in the picture! Run on 3-12 VDC. Fully wired and tested, ready to go and easy to use!

RX-433 Data Receiver	**$16.95**	**TX-433 Data Transmitter**	**$14.95**
RXD-433 Receiver/Decoder	**$21.95**	**TXE-433 Transmitter/Encoder**	**$19.95**

World's Smallest TV Transmitters

We call them the 'Cubes'.... Perfect video transmission from a transmitter you can hide under a quarter and only as thick as a stack of four pennies - that's a nickel in the picture! Transmits color or B&W with fantastic quality - almost like a direct wired connection to any TV tuned to cable channel 59. Crystal controlled for no frequency drift with performance that equals models that cost hundreds more! Basic 20 mW model transmits up to 300' while the high power 100 mW unit goes up to 1/4 mile. Their very light weight and size make them ideal for balloon and rocket launches, R/C models, robots - you name it! Units run on 9 volts and hook-up to most any CCD camera or standard video source. In fact, all of our cameras have been tested to mate perfectly with our Cubes and work great. Fully assembled - just hook-up power and you're on the air! One customer even put one on his dog!

C-2000, Basic Video Transmitter	**$89.95**	**C-2001, High Power Video Transmitter**	**$179.95**

CCD Video Cameras

Top quality Japanese Class 'A' CCD array, over 440 line line resolution, not the off-spec arrays that are found on many other cameras. Don't be fooled by the cheap CMOS single chip cameras which have 1/2 the resolution, 1/4 the light sensitivity and draw over twice the current! The black & white models are also super IR (Infra-Red) sensitive. Add our invisible to the eye, IR-1 illuminator kit to see in the dark! Color camera has Auto gain, white balance, Back Light Compensation and DSP! Available with Wide-angle (80º) or super slim Pin-hole style lens. Run on 9 VDC, standard 1 volt p-p video. Use our transmitters for wireless transmission to TV set, or add our IB-1 Interface board kit for super easy direct wire hook-up to any Video monitor, VCR or TV with A/V input. Fully assembled, with pre-wired connector.

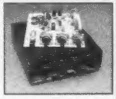
CCDWA-2, B&W CCD Camera, wide-angle lens	**$69.95**
CCDPH-2, B&W CCD Camera, slim fit pin-hole lens	**$69.95**
CCDCC-1, Color CCD Camera, wide-angle lens	**$129.95**
IR-1, IR Illuminator Kit for B&W cameras	**$24.95**
IB-1, Interface Board Kit	**$14.95**

AM Radio Transmitter

Operates in standard AM broadcast band. Pro version, AM-25, is synthesized for stable, no-drift frequency and is setable for high power output where regulations allow, typical range of 1-2 miles. Entry-level AM-1 is tunable, runs FCC maximum 100 mW, range 1/4 mile. Both accept line-level inputs from tape decks, CD players or mike mixers, run on 12 volts DC. Pro AM-25 includes AC power adapter, matching case and bottom loaded wire antenna. Entry-level AM-1 has an available matching case and knob set that dresses up the unit. Great sound, easy to build - you can be on the air in an evening!

AM-25, Professional AM Transmitter Kit	**$129.95**
AM-1, Entry level AM Radio Transmitter Kit	**$29.95**
CAM, Matching Case Set for AM-1	**$14.95**

Mini Radio Receivers



Imagine the fun of tuning into aircraft a hundred miles away, the local police/fire department, ham operators, or how about Radio Moscow or the BBC in London? Now imagine doing this on a little radio you built yourself - in just an evening! These popular little receivers are the nuts for catching all the action on the local ham, aircraft, standard FM broadcast radio, shortwave or WWV National Time Standard radio bands. Pick the receiver of your choice, each easy to build, sensitive receiver has plenty of crystal clear audio to drive any speaker or earphone. Easy one evening assembly, run on 9 volt battery, all have squelch except for shortwave and FM broadcast receiver which has subcarrier output for hook-up to our SCA adapter. The SCA-1 will tune in commercial-free music and other 'hidden' special services when connected to FM receiver. Add our snazzy matching case and knob set for that smart finished look!

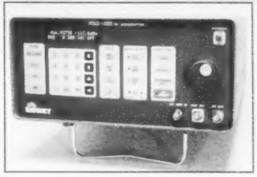
AR-1, Airband 108-136 MHz Kit	**$29.95**	**FR-6, 6 Meter FM Ham Band Kit**	**$34.95**
HFRC-1, WWV 10 MHz (crystal controlled) Kit	**$34.95**	**FR-10, 10 Meter FM Ham Band Kit**	**$34.95**
FR-1, FM Broadcast Band 88-108 MHz Kit	**$24.95**	**FR-146, 2 Meter FM Ham Band Kit**	**$34.95**
SR-1, Shortwave 4-11 MHz Band Kit	**$29.95**	**FR-220, 220 MHz FM Ham Band Kit**	**$34.95**
SCA-1 SCA Subcarrier Adapter kit for FM radio	**$27.95**	**Matching Case Set (specify for which kit)**	**$14.95**

PIC-Pro Pic Chip Programmer

Easy to use programmer for the PIC16C84, 16F84, 16F83 microcontrollers by Microchip. All software - editor, assembler, run and program - as well as free updates available on Ramsey download site! This is the popular unit designed by Michael Covington and featured in Electronics Now, September 1998. Connects to your parallel port and includes the great looking matching case, knob set and AC power supply. Start programming those really neat microcontrollers now...order your PICPRO today!

PIC-1, PICPRO PIC Chip Programmer Kit	**$59.95**

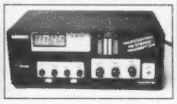
1 GHz RF Signal Generator



A super price on a full featured RF signal generator! Covers 100 KHz to 999.99999 MHz in 10 Hz steps. Tons of features; calibrated AM and FM modulation, 90 front panel memories, built-in RS-232 interface, +10 to -130 dBm output and more! Fast and easy to use, its big bright vacuum florescent display can be read from anywhere on the bench and the handy 'smart-knob' has great analog feel and is intelligently enabled when entering or changing parameters in any field – a real time saver! All functions can be continuously varied without the need for a shift or second function key. In short, this is the generator you'll want on your bench, you won't find a harder working RF signal generator - and you'll save almost $3,000 over competitive units!

RSG-1000B RF Signal Generator	**$1995.00**

Super Pro FM Stereo Transmitter



Professional synthesized FM Stereo station in easy to use, handsome cabinet. Most radio stations require a whole equipment rack to hold all the features we've packed into the FM-100. Set freq with Up/Down buttons, big LED display. Input low pass filter gives great sound (no more squeals or swishing from cheap CD inputs!) Limiters for max 'punch' in audio - without over mod. LED meters to easily set audio levels, built-in mixer with mike, line level inputs. Churches, drive-ins, schools, colleges find the FM-100 the answer to their transmitting needs, you will too. Great features, great price! Kit includes cabinet, whip antenna, 120 VAC supply. *We also offer a high power export version of the FM-100 fully assembled with one watt of RF power, for miles of program coverage. The export version can only be shipped if accompanied by a signed statement that the unit will be exported.*

FM-100, Pro FM Stereo Transmitter Kit	**$249.95**
FM-100WT, Fully Wired High Power FM-100	**$399.95**

FM Stereo Radio Transmitters

No drift, microprocessor synthesized! Great audio quality, connect to CD player, tape deck or mike mixer and you're on-the-air. Strapable for high or low power! Runs on 12 VDC or 120 VAC. Kit includes snazzy case, whip antenna, 120 VAC power adapter - easy one evening assembly.

FM-25, Synthesized Stereo Transmitter Kit	**$129.95**

Lower cost alternative to our high performance transmitters. Great value, easily tunable, fun to build. Manual goes into great detail about antennas, range and FCC rules. Handy for sending music thru house and yard, ideal for school projects too - you'll be amazed at the exceptional audio quality! Runs on 9V battery or 5 to 15 VDC. Add matching case and whip antenna set for nice 'pro' look.

FM-10A, Tunable FM Stereo Transmitter Kit	**$34.95**
CFM, Matching Case and Antenna Set	**$14.95**
FMAC, 12 Volt DC Wall Plug Adapter	**$9.95**

RF Power Booster

Add muscle to your signal, boost power up to 1 watt over a freq range of 100 KHz to over 1000 MHz! Use as a lab amp for signal generators, plus many foreign users employ the LPA-1 to boost the power of their FM transmitters, providing radio service through an entire town. Runs on 12 VDC. For a neat finished look, add the nice matching case set. Outdoor unit attaches right at the antenna for best signal - receiving or transmitting, weatherproof, too!

LPA-1, Power Booster Amplifier Kit	**$39.95**
CLPA, Matching Case Set for LPA-1 Kit	**$14.95**
LPA-1WT, Fully Wired LPA-1 with Case	**$99.95**
FMBA-1, Outdoor Mast Mount Version of LPA-1	**$59.95**

FM Station Antennas

For maximum performance, a good antenna is needed. Choose our very popular dipole kit or the Comet, a factory made 5/8 wave colinear model with 3.4 dB gain. Both work great with any FM receiver or transmitter.

TM-100, FM Antenna Kit	**$39.95**
FMA-200, Vertical Antenna	**$114.95**

Order Toll-free: 800-446-2295

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For Technical Info, Order Status
Call Factory direct: 716-924-4560

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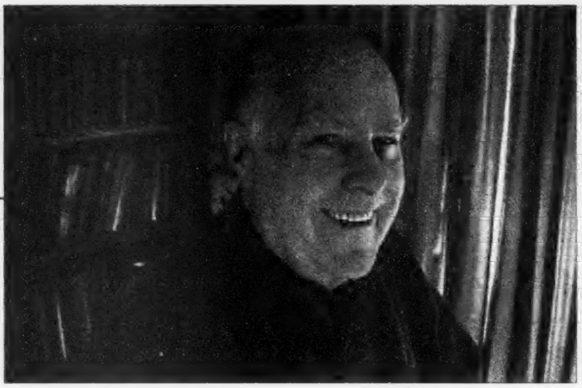
NEVER SAY DIE



Wayne Green W2NSD/1
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Mooned

I hope you didn't miss seeing the Feb. 15th Fox TV special program on NASA's Moon landing hoax.

For those of you who've considered me crazy for being convinced that NASA faked all of the Moon landings, this program must have been a terrible shocker.

A while back Ralph René sent me a copy of his *NASA Mooned America*. Since I am known to have no problem with being controversial, I get a lot of weird books to review. And, every now and then, one of them makes sense.

The whole idea that the biggest American accomplishment of the century might have been totally faked was far out. But, when I read René's book, it made sense. For instance, NASA's photos of the LEM on the Moon, with there being no hint of any burn marks under it where the rockets should have made a hole and blasted away the dust, was a shocker. Instead, there was undisturbed dust under it. And René had a long list of serious discrepancies, plus a list of the 13 astronauts in the program who mysteriously died just at the time they would have been ordered to go along with the fakery.

If you're interested in becoming unignorant on the subject, you can order René's book ($30) from my Web site, [www.waynegreen.com]. Normally I don't sell the books I review, but where there is no other source and the book is important, so what the hell.

My interest piqued, I read Bill Kaysing's *We Never Went to the Moon*, which made an even stronger case for the hoax. Then, Brian's *Moongate*, for more data. These two books are out of print, as far as I know, elst I'd make them available.

More recently, *Dark Moon*, by David Percy, was published in London. This 568-page, 7- x 10-inch, profusely illustrated $35 book goes into great detail on the cameras, film, space suits, and so on—leaving no wiggle room for anyone wanting to believe that we really did land men on the Moon. Yes, I'm importing the book to make it available in America.

Kaysing, who was an engineer for Rocketdyne, the company that developed the motors for NASA, pointed out that they'd tried five times to make big enough rocket engines to get men to the Moon, and all had failed. The engines used for the supposed Apollo trips didn't have near enough power to loft the needed load. Smaller engines were used, with some kerosene added to make bigger flames.

Percy measured the LEM's hatch and found it much too small for the astronauts in their space suits to get through. And so it went for endless contradictions—like the silent background when the LEM was coming in for a landing on the Moon. At the time the LEM's rocket engine was slowing it down for the landing, and a rocket engine is not a quiet beast, it makes a hell of a noise—yet the only sound from inside the LEM was the astronaut talking to Houston as they landed.

And what did the NASA spokesman have to say about the many points brought up on the TV show? He had no answer for anything, except that anyone who doesn't believe we went to the Moon is a nut.

A chap who seemed to know the inside of what had gone on called me after the show and suggested that I get some Russian satellite photos of Alice Springs (in the Australian outback) and look for the huge geodesic dome where the Moon photos were taken.

If you do run into a true NASA believer, ask them to ponder *this* data: According to NOAA reports, the x-ray radiation in space beyond the Van Allen Belt is 0.1 rads per second, and that doesn't count the added radiation from Sun flares, which are a daily occurrence. Also, it takes an average of 3.2 rads per second from the Sun hitting the Van Allen Belt to keep it charged. So, just with the 0.1 rad x-rays in space the astronauts on a 12-day trip to the Moon and back would absorb over 100,000 rads. Yet 500 is a lethal dose.

Plus the much higher radiation picked up going through the Van Allen Belt twice, and any solar flare radiation.

Please ask NASA or any of their disinformation agents to explain that.

René was furious. After some six hours of interviews on video for the show he only got a couple of minutes on the air.

Couple-a-Quotes

"Whoever looks at all of the evidence and believes we went to the Moon is either in denial or is part of the disinformation—it's incredibly obvious that we didn't go!"—Bob Norberg K6BZM.

"I have been using the Plant Growth Stimulator for 16 days and have found, like others, that my weight is going down and, more importantly, I have a lot more energy."—Mike Hughes, Snohomish WA.

"I have an MBA and a master's degree in industrial engineering. I agree that most of the time in college is wasted—no useful learning occurs there!"—Bill Higgins, Woodinville WA.

Still Another Cover-up?

Maybe you missed the *20/20* program about the Oklahoma City bombing cover-up.

They interviewed several people who saw an Oklahoma County Bomb Squad truck across the street from the Murrah Building just before the blast. One witness said he saw paramilitary Bomb Squad personnel searching the outside of the courthouse across the street before the blast. He also said he'd seen several fire trucks heading toward the Murrah Building just before the blast.

Contrary to official denials, *20/20* established that the Oklahoma City Fire Department had gotten a call from the FBI five days before the bombing to be on the lookout for suspicious people. And *20/20* quoted an official government document confirming that the Department of Justice in Washington had received a phone call 24 minutes before the bombing saying that the Murrah Building had just been bombed.

By a strange coincidence (think of the odds!), the ATF

Continued on page 59

Big Savings on Radio Scanners

Uniden® SCANNERS AOR

NEW!

Bearcat® 780XLT Trunk Tracker III

Mfg. suggested list price $529.95

Less -$190 Instant Rebate / Special $339.95

500 Channels • 10 banks • CTCSS/DCS • S Meter

Size: $7^{5/8}$" Wide x $6^{15/16}$" Deep x $2^{13/16}$" High

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The Bearcat 780XLT has 500 channels and the widest frequency coverage of any Bearcat scanner ever. Packed with features such as Trunktracker III to cover EDACS, Motorola and EF Johnson systems, control channel only mode to allow you to automatically trunk certain systems by simply programming the control channel, S.A.M.E. weather alert, full-frequency display & backlit controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control with RS232 port, Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette ligher cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for $29.95; The BC780XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. For fastest delivery, order on-line at www.usascan.com.

Bearcat® 895XLT Trunk Tracker

Mfg. suggested list price $499.95

Less -$320 Instant Rebate / Special $179.95

300 Channels • 10 banks • Built-in CTCSS • S Meter

Size: $10^{1/2}$" Wide x $7^{1/2}$" Deep x $3^{3/8}$" High

Frequency Coverage: 29.000-54.000 MHz., 108.000-174 MHz., 216.000-512.000 MHz., 806.000-823.995 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.

The Bearcat 895XLT is superb for intercepting trunked communications transmissions with features like TurboScan™ to search VHF channels at 100 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a Signal Strength Meter, RS232C Port to allow computer-control of your scanner via optional hardware and 30 trunking channel indicator annunciators to show you real-time trunking activity for an entire trunking system. Other features include Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - Lets you record channel activity from the scanner onto a tape recorder. CTCSS Tone Board (Continuous Tone Control Squelch System) allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box $14.95; MB001 Mobile mounting bracket $14.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached $19.95. The BC895XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS or LTR systems.

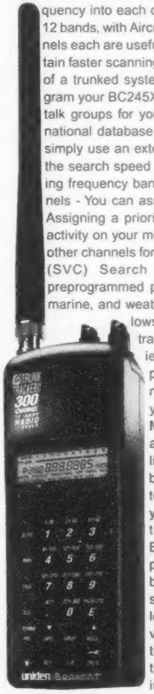
Bearcat® 245XLT Trunk Tracker II

Mfg. suggested list price $429.95/**CEI price $189.95**

300 Channels • 10 banks • Trunk Scan and Scan Lists
Trunk Lockout • Trunk Delay • Cloning Capability
10 Priority Channels • Programmed Service Search

Size: $2^{1/2}$" Wide x $1^{3/4}$" Deep x 6" High

Frequency Coverage:
29.000-54,000 MHz., 108-174 MHz., 406-512 MHz., 806-823.995 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.



Our Bearcat TrunkTracker BC245XLT, is the world's first scanner designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS and EDACS® analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. Our scanner offers many new benefits such as Multi-Track - Track more than one trunking system at a time and scan conventional and trunked systems at the same time. 300 Channels - Program one frequency into each channel. 12 Bands, 10 Banks - Includes 12 bands, with Aircraft and 800 MHz. 10 banks with 30 channels each are useful for storing similar frequencies to maintain faster scanning cycles or for storing all the frequencies of a trunked system. Smart Scanner - Automatically program your BC245XLT with all the frequencies and trunking talk groups for your local area by accessing the Bearcat national database with your PC. If you do not have a PC simply use an external modem. Turbo Search - Increases the search speed to 300 steps per second when monitoring frequency bands with 5 KHz. steps. 10 Priority Channels - You can assign one priority channel in each bank. Assigning a priority channel allows you to keep track of activity on your most important channels while monitoring other channels for transmissions. Preprogrammed Service (SVC) Search - Allows you to toggle through preprogrammed police, fire/emergency, railroad, aircraft, marine, and weather frequencies. Unique Data Skip - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. Memory Backup - If the battery completely discharges or if power is disconnected, the frequencies programmed in your scanner are retained in memory. Manual Channel Access - Go directly to any channel. LCD Back Light - An LCD light remains on for 15 seconds when the back light key is pressed. Autolight - Automatically turns the backlight on when your scanner stops on a transmission. Battery Save - In manual mode, the BC245XLT automatically reduces its power requirements to extend the battery's charge. Attenuator - Reduces the signal strength to help prevent signal overload. The BC245XLT also works as a conventional scanner. Now it's easy to continuously monitor many radio conversations even though the message is switching frequencies. The BC245XLT comes with AC adapter, one rechargeable long life ni-cad battery pack, belt clip, flexible rubber antenna, earphone, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, ESAS or LTR systems. Hear more action on your radio scanner today. Order on-line at www.usascan.com for quick delivery.

More Radio Products

Save even more on radio scanners when purchased directly from CEI. Your CEI price after instant rebate is listed below:

Bearcat 895XLT 300 ch. Trunktracker I base/mobile scanner	$179.95
Bearcat 780XLT 500 ch. Trunktracker III base/mobile	$339.95
Bearcat 278CLT 100 ch. AM/FM/SAME WX alert scanner	$159.95
Bearcat 245XLT 300 ch. Trunktracker II handheld scanner	$189.95
Bearcat 248CLT 50 ch. base AM/FM/weather alert scanner	$89.95
Bearcat Sportcat 200 alpha handheld sports scanner	$169.95
Bearcat Sportcat 180B handheld sports scanner	$149.95
Bearcat 80XLT 50 channel handheld scanner	$99.95
Bearcat 60XLT 30 channel handheld scanner	$74.95
Bearcat BCT7 information mobile scanner	$139.95
AOR AR8200 Mark II Wide Band handheld scanner	$539.95
AOR AR16BQ Wide Band scanner with quick charger	$209.95
ICOM ICR8500 wideband communications receiver	$1,469.95
ICOM PCR1000 computer communications receiver	$379.95
ICOM R10 handheld wideband communications receiver	$279.95
Uniden WX100 Weather Alert with S.A.M.E. feature	$49.95

AOR® AR8200 Mark IIB Radio Scanner

AOR8200 Mark IIB-A wideband handheld scanner/**SPECIAL $539.95**

1,000 Channels • 20 banks • 50 Select Scan Channels
PASS channels: 50 per search bank + 50 for VFO search
Frequency step programmable in multiples of 50 Hz.

Size: $2^{1/2}$" Wide x $1^{3/8}$" Deep x $6^{1/8}$" High

Frequency Coverage:
500 KHz to 823.995 MHz, 849.0125-868.995 MHz, 894.0125-2,040.000 MHz
(Full coverage receivers available for export and FCC approved users.)

The AOR AR8200 Mark IIB is the ideal handheld radio scanner for communications professionals. It features all mode receive: WFM, NFM, SFM (Super Narrow FM), WAM, AM, NAM (wide, standard, narrow AM), USB, LSB & CW. Super narrow FM plus Wide and Narrow AM in addition to the standard modes. The AR8200 also has a versatile multi-function band scope with save trace facility, twin frequency readout with bar signal meter, battery save feature with battery low legend, separate controls for volume and squelch, arrow four way side rocker with separate main tuning dial, configuarable keypad beep/illumination and LCD contrast, write protect and keypad lock, programmable scan and search including LINK, FREE, DELAY, AUDIO, LEVEL, MODE, computer socket fitted for control, clone and record, Flash-ROM no battery required memory, true carrier re-insertion in SSB modes, RF preselection of mid VHF bands, Detachable MW bar aerial. Tuning steps are programmable in multiples of 50 Hz in all modes, 8.33 KHz airband step correctly supported, Step-adjust, frequency offset, AFC, Noise limited & attenuator, Wide and Narrow AM in addition to the standard modes. For maximum scanning pleasure, you can add one of the following optional slot cards to this scanner: CT8200 CTCSS squelch & search decoder $89.95; EM8200 External 4,000 channel backup memory, 160 search banks. $69.95; RU8200 about 20 seconds chip based recording and playback $69.95; TE8200 256 step tone eliminator $59.95. In addition, two leads are available for use with the option socket. CC8200 PC control lead with CD Rom programming software $109.95; CR8200 tape recording lead $59.95. Includes 4 1,000 mAh AA ni-cad batteries, charger, cigar lead, whip aerial, MW bar antenna, belt hook, strap and one year limited AOR warranty. Enter your order now at http://www.usascan.com.

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continued from page 1

as well as in terms of spectrum conservation. The ARRL leadership says it believes that Morse testing should be retained in the United States. It also calls on it's headquarters staff to develop a program designed to promote the use of the code.

This new resolution superseded all previous Board policy statements regarding Morse code and Article S25. It also means the ARRL will not vote against proposals at the International Amateur Radio Union Region 2 Conference next October or at WRC 2003. It's the latter conference which might call for elimination of the Morse testing requirement from the international radio regulations.

What does this change of position mean for the United States ham radio community? Nothing immediate. Many countries, including the United States, have already lowered their Morse code requirements to 5 words per minute, and others are expected to do so shortly. Also, with it being less than a year since restructuring of the United States Amateur Radio Service was implemented, there is little chance that the issue of Morse testing to come up as an FCC regulatory matter before 2004 at the earliest.

The ARRL's decision to no longer oppose the elimination of Morse code as an international ham radio licensing requirement has not caused much excitement among the rank and file in the United States amateur radio community. At least not among hams who actually operate their stations.

Judging by on-the-air comments monitored by Newsline, those US hams who discuss the matter seem to have expected the League's Board of Directors to accept as inevitable the abolition of the international licensing rule that calls for Morse testing. This, as nation after nation makes known its decision to vote in favor of dropping international radio regulation S25 at the next World Radiocommunications Conference slated for 2003.

In fact, you have to go to the Internet newsgroups to find any real debate or controversy. There, the troops are as usual polarized both for and against the initiative — but even more so than before the recent announcement. Comments range from the ridiculous to the sublime, but there is no way to really derive a consensus from what's being posted.

And, as has so often been pointed out, the Internet, and especially the newsgroups, are not Amateur Radio. Also, the hams without radios who live there have little to say regarding the future of the United States Amateur Radio Service.

Thanks to Roy Neal K6DUE, via Newsline, *Bill Pasternak WA6ITF, editor.*

You Be the Judge

At its first meeting of 2001, held just outside Dallas, the ARRL Board of Directors voted to increase its annual membership dues. The rate for a full member under age 65 rises from $34 to $39. Those over 65 will now pay $34 — up from $28. The dues hike goes into effect July 1, 2001.

Let's see: If you're under 65, that will be 56% more than your "dues" to *73*. Over 65? 36% more.

And which provides you with more fun?

Baffling Batteries of Babylon

Who invented the first battery? Most of you will probably say that the battery is a product of modern times. So you will probably be shocked — no pun intended — shocked to learn that the electric storage battery may date back almost to antiquity.

In 1938, Dr. Wilhelm Konig, an Austrian archaeologist rummaging through the basement of the Baghdad Museum, made a find that was to drastically alter all concepts of ancient science.

A 6-inch-high pot of bright yellow clay dating back two millennia contained a cylinder of sheet copper 5 inches by 1.5 inches. The edge of the copper cylinder was soldered with a 60-40 lead-tin alloy comparable to today's best solder. The bottom of the cylinder was capped with a crimped-in copper disk and sealed with bitumen or asphalt. Another insulating layer sealed the top and also held in place an iron rod suspended into the center of the copper cylinder. The rod showed evidence of having been corroded with acid.

Dr. Konig recognized that this configuration was not a chance arrangement, but that the clay pot was nothing less than an ancient electric battery. The ancient battery in the Baghdad Museum, as well as others which were unearthed in Iraq, all date from the Parthian Persian occupation between 248 B.C. and A.D. 226!

Of course, the discovery of these ancient batteries gives rise to another question: If such cells existed before the birth of Christ, what did they power?

Thanks to Graham Kemp VK4BB, via Q-News Australia, *via* Newsline, *Bill Pasternak WA6ITF, editor.*

20-Year Flywheel?

One controversial technology debate now making the news centers on using flywheels as a power source. Now, an actual flywheel system is available from a company called Beacon Power Corporation.

Beacon Power targets its product at cable television, telephone, broadband, cellular, and PCS applications. Because garden-variety storage batteries need to be replaced every two to three years, Beacon Power says that a flywheel with a 20-year life span can yield impressive cost savings. Read more about Beacon Power by going to [www.beaconpower.com].

Thanks to Newsline, *Bill Pasternak WA6ITF, editor.*

Caching On

Those high-tech Christmas gifts may add more people to a new techno-adventure that is luring computer geeks away from their computer screens and into the real world. Called geocaching, the game takes players from mountaintops to cities, deserts to forests, hunting for a treasure cache, while relying only on the satellite-based Global Positioning System to lead the way.

Rather than counting on the treasure hunting maps of years past, geocaching players use GPS navigation devices to help them find carefully hidden containers full of trinkets. The prizes are secreted everywhere from forests to deep within cities.

According to Jeremy Irish, who runs a geocaching Web site, the motivation for the game is just being able to use the technology. You can find out more at [www.geocaching.org].

Thanks to Newsline, *Bill Pasternak WA6ITF, editor.*

Cola IS It!

Are the following points "the real thing," or just urban myths/suburban legends? Either way, no wonder a certain brand of cola tastes soooo good:

1. In many states (in the USA), the highway patrol carries two gallons of cola in the truck to remove blood from the highway after a car accident.
2. You can put a T-bone steak in a bowl of cola and it will be gone in two days.
3. To clean a toilet: Pour a can of cola into the toilet bowl, let the "real thing" sit for one hour, then flush clean. The citric acid in cola removes stains from vitreous china.
4. To remove rust spots from chrome car bumpers: Rub the bumper with a crumpled-up piece of Reynolds Wrap aluminum foil dipped in cola.
5. To clean corrosion from car battery terminals: Pour a can of cola over the terminals to bubble away the corrosion.
6. To loosen a rusted bolt: Apply a cloth soaked in cola to the rusted bolt for several minutes.
7. To bake a moist ham: Empty a can of cola into the baking pan, wrap the ham in aluminum foil, and bake. Thirty minutes before the ham is finished, remove the foil, allowing the drippings to mix with the cola for a sumptuous brown gravy.
8. To remove grease from clothes: Empty a can of cola into a load of greasy clothes, add detergent, and run through a regular cycle. The cola will help loosen grease stains. It will also clean road haze from your windshield.

FYI:

1. The active ingredient in the most popular cola is phosphoric acid. Its pH is 2.8. It will dissolve a nail in about 4 days.

Continued on page 59

MFJ 1.8-170 MHz SWR Analyzer™

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New MFJ-259B reads antenna SWR . . . Complex RF Impedance: Resistance(R) and Reactance(X) or Magnitude(Z) and Phase(degrees) . . . Coax cable loss(dB) . . . Coax cable length and Distance to fault . . . Return Loss . . . Reflection Coefficient . . . Inductance . . . Capacitance . . . Battery Voltage. LCD digital readout . . . covers 1.8-170 MHz . . . built-in frequency counter . . . side-by-side meters . . . Ni-Cad charger circuit . . . battery saver . . . low battery warning . . . smooth reduction drive tuning . . . and much more!

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You can read SWR, return loss and reflection coefficient at any frequency simultaneously at a single glance.

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Large easy-to-read two line LCD screen and side-by-side meters clearly display your information.

It has built-in frequency counter, Ni-Cad charger circuit, battery saver, low battery warning and smooth reduction drive tuning.

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Here's what you can do

Find your antenna's true resonant frequency. Trim dipoles and verticals.

Adjust your Yagi, quad, loop and other antennas, change antenna spacing and height and watch SWR, resistance and reactance change instantly. You'll know exactly what to do by simply watching the display.

Perfectly tune critical HF mobile antennas in seconds for super DX -- without subjecting your transceiver to high SWR.

Measure your antenna's 2:1 SWR bandwidth on one band, or analyze multiband performance over the entire spectrum 1.8-170 MHz!

Check SWR outside the ham bands without violating FCC rules.

Take the guesswork out of building and adjusting matching networks and baluns.

Accurately measure distance to a short or open in a failed coax. Measure length of a roll of coax, coax loss, velocity factor and impedance.

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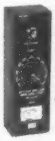
MFJ *SWR Analyzers*™ work so good, many antenna manufacturers use them in their lab and on the production line -- saving thousands of dollars in instrumentation costs! Used worldwide by professionals everywhere.

More MFJ *SWR Analyzers*™

MFJ-249B, $229.95. Like MFJ-259B, but reads SWR, true impedance magnitude and frequency only on LCD. No meters.

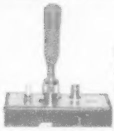
MFJ-209, $139.95. Like MFJ-249B but reads SWR only on meter and has no LCD or frequency counter.



MFJ-219B, $99.95. UHF *SWR Analyzer*™ covers 420-450 MHz. Jack for external frequency counter. 7½x2½x2¼ inches. Use two 9 volt batteries or 110 VAC with MFJ-1312B, $12.95. *Free* "N" to SO-239 adapter.

SWR Analyzer Accessories

Dip Meter Adapter



MFJ-66, $19.95. Plug a dip meter coupling coil into your MFJ *SWR Analyzer*™ and turn it into a sensitive and accurate bandswitched dip meter. Save time and take the guesswork out of winding coils and determining resonant frequency of tuned circuits and Q of coils. Set of two coils cover 1.8-170 MHz depending on your *SWR Analyzer*™.

Genuine MFJ Carrying Case

MFJ-29C, $24.95. Tote your MFJ-259B anywhere with this *genuine* MFJ custom carrying case. Has back pocket with security cover for carrying dip coils, adaptors and accessories.

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Has clear protective window for frequency display and cutouts for knobs and connectors so you can use your MFJ *SWR Analyzer*™ without taking it out of your case. *Look for the MFJ logo for genuine authenticity!*

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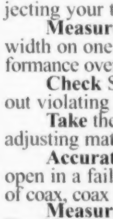

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LETTERS

From the Ham Shack

Brian Lawn ZL2AJS, New Zealand. A neighborly ham, Ian ZL2IH, lent me a copy of your magazine, the July 1999 issue, number 465. He knew I would be interested in the "Long Beach Longwire" article by Hank WB6MEU.

About two-plus years ago, I tried the same wire (electric fencing wire) in a G5RV configuration and found that it worked well. In particular, it is very handy as a light and compact portable antenna.

Not long after that, another neighborly ham, Greg ZL2BZH, stopped by, saw this antenna, and grabbed my multimeter. Ah-ha, about 16 ohms per meter (6 stainless strands of course). In a G5RV, this equates to about 248 ohms per leg. Seemed to be as good as good copper wire. He was reasonably sure that the resistance was better than some commercial high resistance wire he had.

That reel of Polywire was about $12 (NZ$) for a 200m roll. So I went back to the local "Stock Firm" (the name usually given to a farmers' retail outlet) and had a good look at the labels on the other types of wire. I found a more suitable wire — the same basic material as the Polywire, possibly stronger, but now called "Turbo Wire." This has 9 strands, of which 6 are stainless and three, coated copper. This is stated to have 130 ohms per kilometer (209 ohms per mile). Greg and I shared a 40m roll — it was about twice the price of the Polywire.

My main antenna is a G5RV from TV ribbon and Turbo Wire which has stood more than two years of coastal weather. Of course, I have a portable system of the same material and configuration. For portable use, I also use very thin 50 ohm coax.

There are a number of members of our club (New Plymouth Branch 27 of NZART) who do not really believe that the system works. One particular member was operating during the last JOTA with the club rig and my portable G5RV, the center of which was about 7 meters up and the ends tied onto a fence. He had a satisfactory — maybe as good as with his beam at home — contact with South Africa! I did see him look strangely at the mike and say "IT WORKS!"

The Turbo Wire does perform better than the Polywire, but there is not much in it. By the way, the fine print on the label reads: Gallagher Power Fence Systems, Private Bag 3026, Hamilton, New Zealand.

Louis L. D'Antuono WA2CBZ, 8802 Ridge Blvd., Brooklyn NY 11209. I'm looking for references to articles written about New York City's Radio Row on Cortlandt St. Can anybody help? Thanks …

Noel P. Larson W0CXR, 11423 Sorenson Lake Rd., Merrifield MN 56465. I need some help that I hope your readers can provide. I have a number of the Heathkit line of monobanders that I am collecting, and of course some of them are in need of some repair. In the accompanying schematic detail, perhaps you can see T4, which is between V12A and the 8-ohm speaker.

First, what would be a suitable replacement? Otherwise, I will have to rewind it (I really hate to admit this, but it has been a little over 50 years since I have wound a transformer). What would be the proper wire to rewind with? Thank you very much.

Les Warriner WA7HAM [leswa7ham @bentonrea.com]. It really is starting to blow my mind, the capabilities of computers on the ham bands with only a sound card in the computer to interface the transceiver and computer and make intelligence. Used to was that we had to have big clumsy chassis full of tubes and components to make intelligence out of the different available transmitting modes. Then we went to the TNCs and now we are down to a sound card, almost any of them will work from $16.95 and up, and a couple of cables.

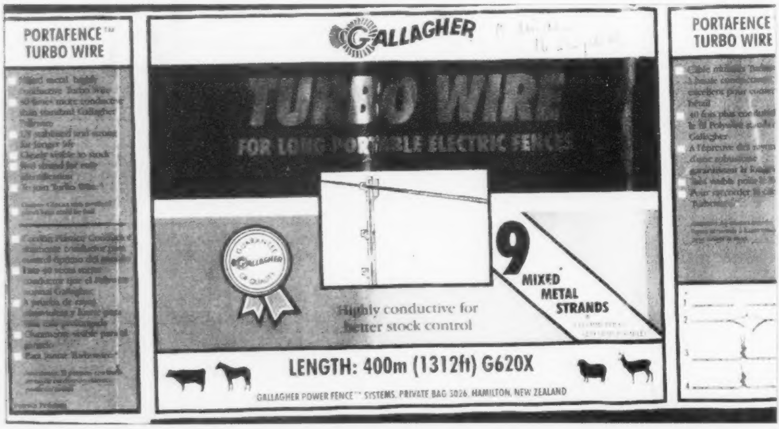
I am now working Pactor, RTTY, PSK31, CW, and a couple of other "antique" modes such as Hellschreiber with only this setup. 40 watts from the Pegasus to an MFJ all-band vertical and working Europe on 10 meters every day.

Working Japan is about the same as working Oregon — no challenge.

When I worked at Boeing on the 747 computer systems, a guy there holding a Ph.D. in Computer Science was trying to explain to us and show us how to filter signals with software, and it worked. Many of his innovations are flying daily in those birds. And a lot of these same methods are being used by hams in developing software for the various communications modes. And they work!!

I guess that I am not a true ham nor do I enjoy motormouthing to various and sundry stations comparing the latest surgeries and such. It is a lot of fun, however, and worth every hour spent to get into these new modes and experiment with them. RTTY

Continued on page 57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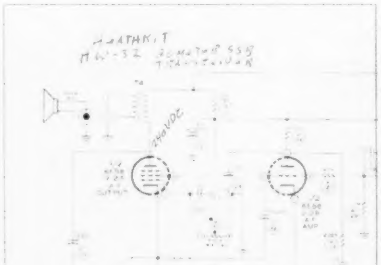

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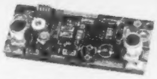

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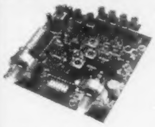

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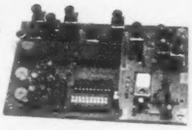

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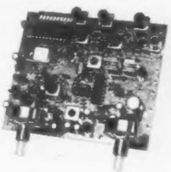

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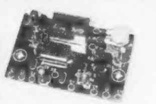

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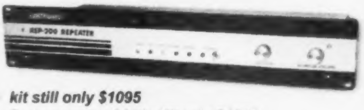

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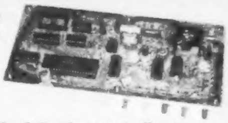

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Sabah — Land Below the Wind

Come along on this DXpedition to 9M6 ...

After a 14-hour flight via Kuala Lumpur, Jan and I arrived at Kota Kinabalu International Airport at 11:30 p.m. It was raining, as only it can in Southeast Asia. Transport for the ten-minute journey to the Shangri-La Tanjung Aru Hotel was waiting, and we very quickly checked into room 428 and went to bed.

It was still raining the following morning, but I lost no time in getting organized. Thanks to the good offices of Phil Weaver 9M6CT, VS6CT, HS0/G4JMB, and Godfrey Yin 9M6GY, the ground had been well prepared. Our top floor room had a west-facing balcony, overlooking about 100 meters of lawn to the sea. My temporary license as 9M6PWT had been issued well in advance, and I had a fax from the hotel giving me permission to set up my antenna. The hotel could not have been more helpful, even making one of its staff available to assist me in rigging the antenna. There was a strategically placed palm tree on the lawn, so an antenna running east/west at about 10 meters high seemed to be the most practical arrangement. It was a simple exercise to get a halyard over the palm tree and to rig the simple dipole between the balcony and the tree, with band changing being effected by lowering the antenna and changing crocodile clips to lengthen or shorten it.

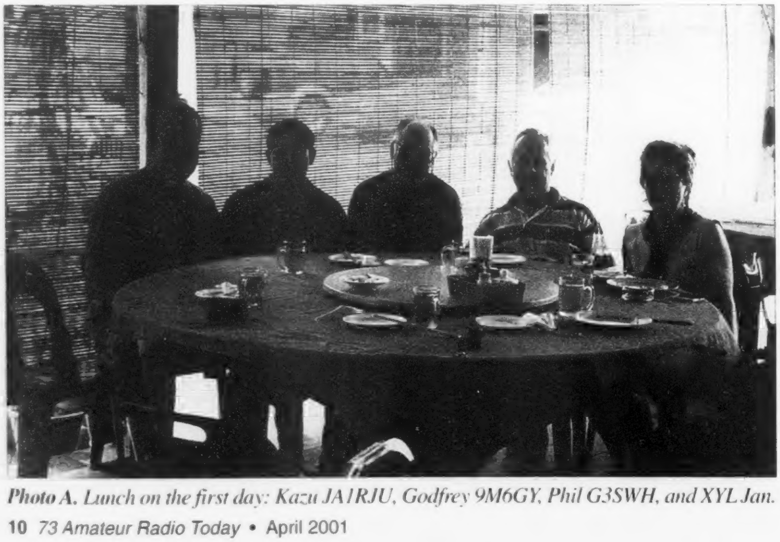

Photo A. Lunch on the first day: Kazu JA1RJU, Godfrey 9M6GY, Phil G3SWH, and XYL Jan.

While I was outside, Phil Weaver phoned to say that he would be picking us up at 11 a.m. to show us round the town. Godfrey also phoned to invite us to lunch. I managed to get the station, an Icom IC-706 transceiver, switched mode power supply, and 486-based laptop computer running CT, set up on the balcony and to make the first QSO with RW0SQ on 12 meters CW at 02:11 UTC on 4 November 1999, although the other bands didn't look too lively.

It was raining again by the time Phil collected us and gave us the conducted tour of Kota Kinabalu, the state capital and locally known as KK. Arriving at Godfrey's home, we were introduced to his wife, Stella 9M6JY, and handed a formal invitation to dinner that evening as guests of the Sabah Amateur Radio Society. We were joined for lunch by Donald Soh 9M6SU, and by Kazu JA1RJU, 9M6JU, both of whom had been on the 1998 expedition to the Spratly Islands 9M0C. Kazu was visiting KK to operate on 50 MHz from a flat on the top of a 15-story building.

Phil dropped us back at the hotel in the late afternoon and arranged to collect us again at 6:30 p.m. to take us to

Photo B. Dinner with SARS. Back, L–R: Augustine 9W6AN, Stella 9M6JY, Godfrey 9M6GY, Ho 9W6HC, Patrick 9M6PK, Lu 9W6LU, Richard 9M6RC. Seated, L–R: Phil 9M6CT, Kazu JA1RJU, Lawrence 9M6LK, XYL Jan, Phil G3SWH.

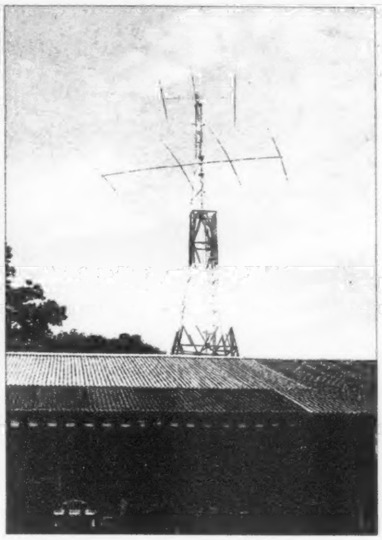

Photo C. The antennas at 9M6AAC.

dinner. I managed an hour or so on the air, but activity on 12 and 20 meters was not very good. I tried 40 meters just before sunset but there is a major problem with intruders operating SSB in the band. The level of interference is incredible, particularly in the early evenings, and it was very difficult to find a clear frequency, let alone make any QSOs.

Kazu JA1RJU and 10 members of SARS joined us for dinner at the Kampung Nelayan Seafood Restaurant. Jan and Stella were called upon to choose the food from an extensive array of fresh, local vegetables, fish, and live crabs. Phil and I discussed the state of the bands, and he confirmed the lack of activity during daylight hours, recommending that I concentrate on 40 meters, as East Malaysia is apparently much in demand on that band. DX-EDGE indicated an opening into the eastern USA and a full darkness path to Europe, with dawn at about 2200 UTC (6 a.m.), when the intruders would (hopefully) still be in bed.

Jan and Stella went shopping the following morning, with the excuse that I could then play radio in peace for a couple of hours. This sounded like a good idea, but unfortunately activity died after about 9.30 a.m. The girls didn't get back until well after 2 p.m., by which time I had made only a few

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***Photo D.** G3SWH relaxes between QSOs at the Tanjung Aru.*

QSOs, including A45XR and EL2WW, so I was certainly getting out. Another late afternoon/early evening session added a few more QSOs to the log, but 40 meters was again hard going.

Dinner that evening was an informal affair with Godfrey and Stella at the KK Yacht Club, of which Godfrey is a former commodore. Kelly, their 19-year-old daughter, joined us. After dinner, I managed another short session on 40 meters around 10 p.m. and found the band much quieter, but we had to be up early.

Next day, we took the train from KK to Tenom, a small town in the interior. There are only 154 km of narrow gauge railway track in the whole of Sabah, connecting KK to Melalap. The best part of the journey was between Beaufort and Tenom, where the train was packed with locals and their produce. The track follows the course of the Sungai Padas through spectacular gorges and over rickety wooden bridges with excellent views of the jungle and muddy brown river.

At Tenom, Godfrey had arranged for us to be met by Alex Yong 9W6JP. Alex holds a Class B, 2-meters-only license, and runs a coffee roasting and packaging business in the town. He very kindly drove us to Hillview Gardens in Keningau, home of 9M6AAC, where we met the owners, Alfons 9M6MU and Doris 9M6DU. What a fabulous QTH! On top of a hill, with a clear take off in all directions and the nearest obstruction over 20 km away. Jani YB0US/NM6US/9M6US was in the process of putting the finishing touches to the new shack in anticipation of the arrival the following day of Bob N2OO and his gang for the start of their Borneo Expedition. Phil and Godfrey were waiting for us and, after lunch, drove us back to the hotel in KK, where we watched a most spectacular sunset before another short battle with the intruders on 40 meters.

The following morning, an early session on 40 meters included a QSO with G3VZT, my first G. Phil picked me up at 8 a.m. and took me to the Promenade Hotel in downtown KK for breakfast with Bob N2OO and Bill N2WB, who had arrived in the small hours. Jan had suffered a sleepless night, took the opportunity of a lie-on and didn't join us. Doris, Alfons and Jani were there also, ready to drive Bob and Bill back to Keningau.

Later, I took down the antenna and packed up the station, as we were leaving very early next morning for the next stage of our holiday. I made 412 CW QSOs from the Tanjung Aru Hotel, 224 of which were on 40 meters, in just over eight hours of operating between 4 and 7 November 1999.

At 5:30 a.m. on the 8th, we were at the airport boarding the commuter flight from KK to Sandakan on the east coast. We were met by our personal guide, Khui Lin, and dropped our nonessential baggage at the Renaissance Hotel before departing for an overnight stay at the Sukau River Lodge on the Sungai Kinabatangan. During the two-hour road journey, we stopped at the Gomantong Caves, which are Sabah's most famous source of the swiftlets' nests used for bird's-nest soup. The carefully constructed wooden walkway over the floor of the caves is so slippery with guano as to be treacherous, and you dare not put your hand on the safety rail for fear of gathering a handful of cockroaches. Not recommended for the faint-hearted!

A narrow corridor of rain forest exists along the banks of the Kinabatangan, and the area is rich with wildlife. Sukau is the main village on the lower section, a short distance past the caves. The lodge itself offers comfortable, mosquitoproof, en-suite rooms,

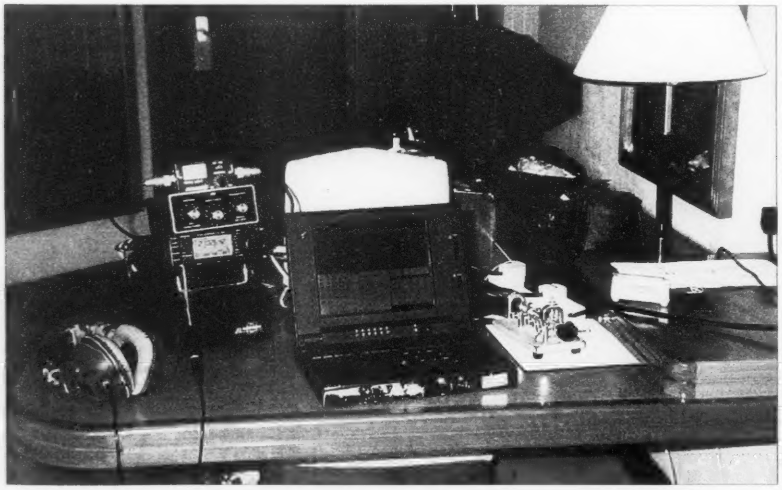

***Photo E.** The setup at the Renaissance Hotel in Sandakan was no different from elsewhere, albeit totally indoors.*

good food, and a bar. We arrived in time for lunch, and afterwards took a short siesta.

In the late afternoon, Khui Lin took us for a cruise on a tributary of the river, where we saw snakes, monitor lizards, long-tailed and pig-tailed macaques, proboscis monkeys, and many species of birds. After dinner, we went for a trek in the jungle around the lodge, seeing various nocturnal creatures. Returning to the lodge, I noticed what looked like a striped snail on my ankle. To the delight of Khui Lin and the other guests, it proved to be a tiger leech feasting on my blood. After being photographed, the poor creature was dispatched with an application of salt, rather than the traditional cigarette end.

Early next morning, we took another river cruise, this time on the main stream. Here we saw three orangutan in the wild — quite a rare sight — a solitary crocodile, macaques, proboscis monkeys, and many birds, including the brilliantly colored stork-billed kingfisher. We landed to explore the oxbow lakes and, after the previous night's experience, put on leechproof socks made of calico, which is too dense for the leeches to penetrate.

After lunch, we returned to Sandakan for two nights at the Renaissance Hotel. Again, Godfrey had prepared the way, and we were allocated Room 713 on the seventh floor. The hotel manager requested a copy of my license but readily agreed to an "unobtrusive" antenna. Unfortunately, the room had no balcony, and Jan immediately had misgivings about me operating in the same room in which she was sleeping. Having suitably reassured her, I set about rigging the antenna, but it was clear that lowering and raising it to change bands would not be possible. I settled for a sloping dipole for 30 meters facing north, and hoped that it would tune for some of the other bands.

The next day, we took a taxi to the Sepilok Orangutan Rehabilitation Center, about 25 km outside town. Orphaned and injured orangutans are brought here from all over Sabah to be rehabilitated to return to forest life. They are free to forage in the surrounding

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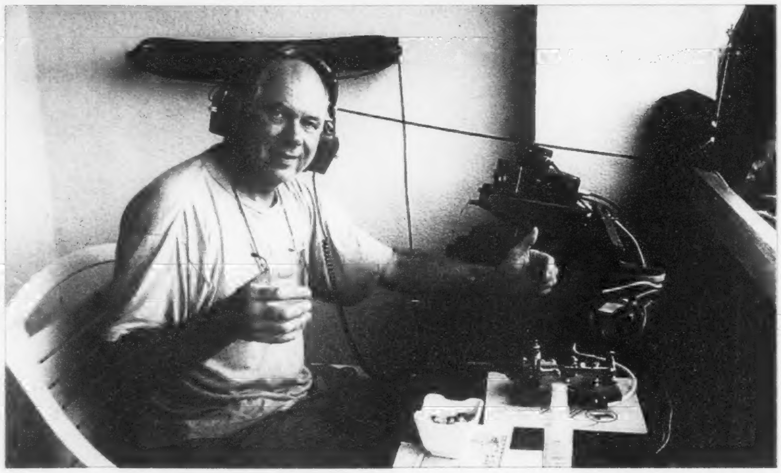

Photo F. Observant readers will note from this photo of G3SWH at the Rasa Ria that he has now gone "/V&T" (vodka and tonic portable).

forest but are fed twice daily at a platform about 10 minutes' walk from the center. We were lucky and saw nine, including a large male and three babies.

We took the local bus back toward Sandakan and stopped off at the Australian War Memorial. This is in a quiet wooded park on the site of a Japanese POW camp during WWII, and the starting point of the infamous "death marches" to Ranau, 250 km away through the jungle. Of some 2,400 Allied soldiers in the camp, only six Australians survived — and they were the ones who escaped. The camp commandant was later executed as a war criminal.

Next morning was our last in Sandakan, and we decided to explore the town. Nowadays, it is a thriving commercial center with a busy waterfront and market, where we were pursued by a group of small boys demanding money. Jan placated them with a tube of polos (candies with a hole in the center)!

We bought some amazingly cheap fabric and tee shirts and took a taxi back to the hotel. There was then just time for a last session on the air before the short flight back to KK. I made 243 CW QSOs from the Renaissance Hotel, 183 of which were on 30 meters, in just over four hours of operating between 9 and 11 November 1999.

Transport was waiting at KK airport and we were driven to the Shangri-La Rasa Ria Hotel at Dalit Bay, about an hour north of the city. We checked into Room 632, once again on the top floor, facing west.

Next morning, I contacted the hotel's engineering manager, who had been informed by the Tanjung Aru of my impending arrival. Again, there were no problems in putting up my antenna. A sloping 40-meter dipole was erected, running east/west between the balcony and a convenient palm tree, with the station on the balcony overlooking the sea.

An early evening session provided a nice run on 40 meters, in spite of the intruders, until Godfrey, Stella, Kelly, and Phil joined us for drinks in our room and a buffet dinner in the hotel restaurant. I resolved to be up early the following morning to work 40 meters. The first QSO was at 2115 UTC and I made 62 QSOs in the hour or so before the band died only 10 minutes after sunrise.

After breakfast, we hired a car with a driver to visit the Mount Kinabalu National Park and the Poring Hot Springs, some 88 km from KK. The springs were developed by the Japanese during WWII and are popular with the local people.

On Sunday the 14th, we hired the same car and driver to take us to the weekly tamu at Kota Balud, a small

Photo G. Dinner at the Rasa Ria: XYL Jan and Phil G3SWH; Stella 9M6JY, Godfrey 9M6GY, and daughter Kelly.

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town about an hour's drive north of the hotel. Tamus are open-air markets where villagers gather to sell their farm produce and to buy manufactured goods from traders. We arrived midmorning and found it to be a colorful melee of locals buying and selling live chickens and rabbits; fish, meat, and vegetables; cooked food; and fabric. There were literally thousands of people, including fewer than a dozen Europeans.

On the way back to the hotel, we stopped at the Mengkabong water village, which is a traditional stilt village built over the mud of the estuary. Most of the simple houses have electricity and telephone; all have fresh water, and many modern cars are parked on the shore, but sanitation is nonexistent. Dogs romp in the mud at low tide and children swim in the river, apparently immune to disease.

That evening, whilst I was working on 17 meters, we received a visit from Will, the tame wreathed hornbill from the hotel's wildlife reserve, who landed on the balcony rail in front of Jan. He then proceeded to devour our bowl of nuts, before flapping off to terrorize some other unsuspecting hotel visitors.

I followed the same formula for our last morning, getting up at about 5 a.m. to work 40 meters, and managed to work a few more Europeans. It was then time to take down the antenna and dismantle the station. I made 506 QSOs from the Rasa Ria Hotel, 375 of which were on 40 meters, in just over ten hours of operating between 12 and 14 November 1999.

I shall have to rethink my antenna setup for future operations, as the limitations of being unable to change band quickly severely hampered me and certainly reduced the overall QSO total, I am quite sure.

Special QSL cards have been printed and are available either from my *Callbook* address with SAE and return postage or via the RSGB bureau.

My particular thanks go to my XYL, Jan; Godfrey 9M6GY; Phil 9M6CT; and the management teams of the three hotels, without whose help and cooperation this DXpedition would not have been possible.

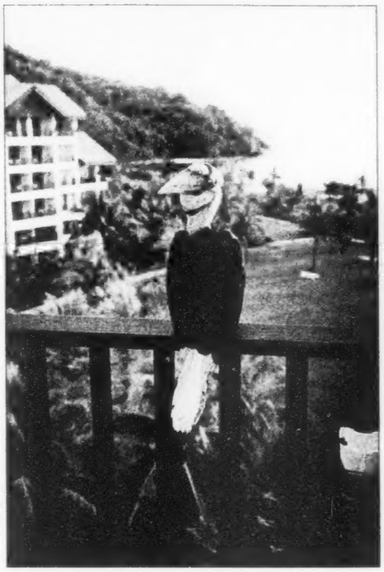

Photo H. *Will, the Rasa Ria's tame wreathed hornbill, was quite an "operator" himself.*

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Arachnida Warcum

*Whatever you call it,
this WARC bands spider species is a triband delta loop well worth trying.*

With apologies to Mr. A. King, my Latin instructor, for the title, let me point out at the outset that this will be a description of an HF antenna, not a technical treatment of why it works the way it does. But this antenna does work, and it works well.

There are three laws that apply to home-brewing a wire antenna. One, real estate. The space needed for the antenna is always smaller than the size of the antenna. Two, the cost of the antenna will be inversely proportional to the size of the builder's wallet. Third, the efficiency of the antenna is directly proportional to the size of the antenna.

With these problems facing the fledgling "Marconi," it could give pause at the start of this project.

Take heart. The following description, complete with dimensions, will suit the average wallet and will fit in the average yard. It also has a slight gain over a dipole, and it seems to be quieter than most antennas. What more could any ham want?

With propagation as good as it has been, this project should be up and running ASAP. According to the DX pundits, these conditions should be around for a while.

The antenna is a triband delta loop. The bands concerned here are the so-called WARC bands, but any number or coverage can be built to your specs. What this article will give you are the dimensions, and how I hung the loops with minimum interaction.

Basically, the antenna is three triangles mounted concentrically [**Fig. 1(b)**]. I used #18 stranded in green. This wire was chosen for strength vs. weight. Actually, I had a supply of this wire from a wise buy at a flea market. Any color or weight will do.

The wire was pre-stretched by looping each element around a tree or post and temporarily tying a square (reef) knot at the free ends around my waist. Then you really lean back against the wire. This stops the element from changing dimensions after it is hung.

The loops are hung one inside the other, with the 30m loop being hung as

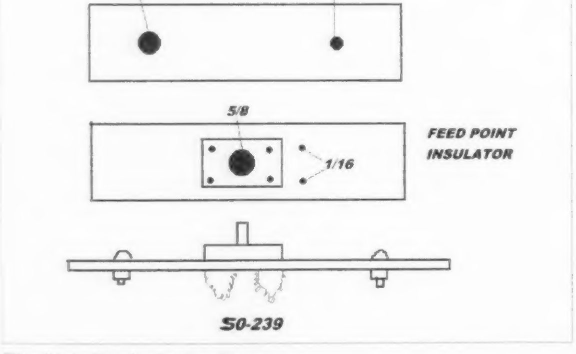

Fig. 1(a). Feedpoint insulator.

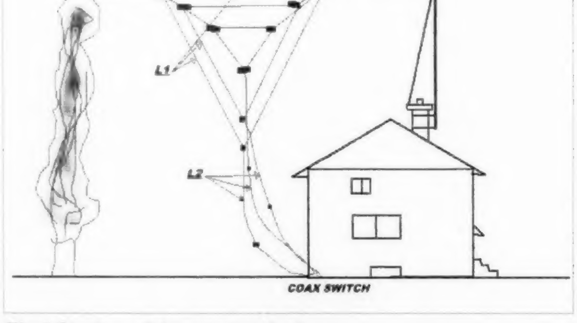

Fig 1(b). Overall hanging method.

TABLE 1

BAND	TOTAL L1	1/4~ MATCHING SECTION	CENTRE FREQ.
30 MTRS	100.35 FT	16 FT.	10.125 MHz
18 MTRS	56.0 FT	8.96 FT.	18.125 MHz
12 MTRS	40.7 FT	6.5 FT.	24.925 MHz
FORMULA L1= $\frac{1016x.VF}{FREQ\ ;\ MHz}$		FORMULA FOR MATCHING xFMR $\frac{246\ x.VF}{FREQ.\ (IN\ MHz)}$	

Table 1. Element lengths.

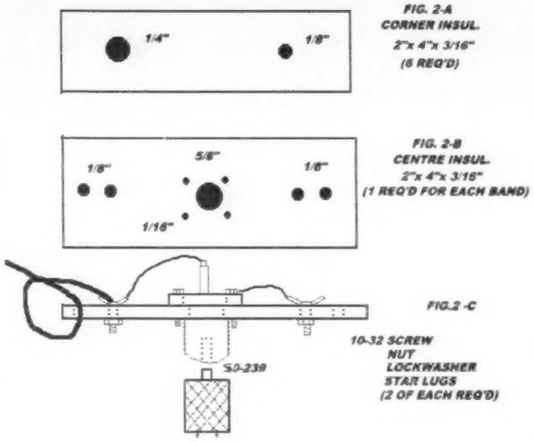

***Fig. 2. (a)** Corner insulator, 2" x 4" x 3/16" (6 required). **(b)** Center insulator, 2" x 4" x 3/16" (1 required for each band). **(c)** 10-32 screw, nut, lock washer, star lugs (2 of each required).*

the main support. The 30m loop is supported by 3/16" marine halyard, which is weather- and UV-impervious, and has a breaking strength of over a thousand pounds. It will not stretch. I use pulleys at the end of the supports so it is easy to adjust the loops just by lowering each end. Then I do the pruning from the ground.

The coax used is RG-58U and RG-59U, to keep the weight to a minimum.

The feedpoint impedance of a delta loop is theoretically 125 ohms. I used a quarter-wave section of RG-59U as an inline impedance transformer, which makes the feedpoint approximately 100 ohms.

Now, don't panic. I said that there would be no technical stuff. So, with that out of the way, we can refer to **Table 1**. Now we assemble our coax 1/4-wave using the RG-9U. A little tip: When using UHF-type connectors, measure from the connector face, not the end of the center pin.

At this point, here is a list of hardware needed:

- 1 large roll of "Coax-Seal" or 1 roll of 3M #33 vinyl tape;
- 9 PL-259 UHF connectors;
- 6 UG-175 adapters;
- 3 UG-176 adapters;
- Enough RG-58U coax to make feedlines from the end of the 1/4-wave transformers to the first available site for a coax switch;
- Enough RG-59U to make the matching sections. Obtain some 3/16" or 1/4" scrap Plexiglas to make the required insulators. A source for this is your local auto glass repair depot. If that doesn't pan out, you can buy 5/8" to 3/4" hardwood dowels, and a pint of outdoor varnish.

In reference to the materials list, you don't have to have both the vinyl tape and sealant. They are used in weatherproofing the feedpoint connection. I have done it both ways. The sealant is easier to use, but I have used the tape method and after more than two years the join was clean and shiny. It takes a little more patience but it will do the job.

Now we're ready to start construction. Measure the element length (after pre-stretching) from **Table 1**. Now cut the coax to length. After you assemble the UHF connector, you'll be an expert at installing coax connectors.

When measuring finished coax cable you measure from the plug face to plug face, *not* the end of the center pin.

Remember, if you want to put up a good antenna (and who doesn't), follow the formulas or recut lengths exactly. I know they appear long according to a lot of antenna books, perhaps because they are close to the ground or to my two-story aluminum siding.

When hanging the loops, I made the horizontal section approximately 10% to 15% longer than the sides of the loop, to help raise the feedpoint above the ground.

The next step is to cut and drill the insulators as in **Fig. 1(a).** As illustrated, the element wire passes through the 1/8" hole, once over the end, and through the 1/8" hole again. This will stop the insulator from moving from its position.

At the feedpoint insulator, the wire goes through the hole twice and is then soldered as required.

For those who are purists, the SWR may not show unity. But with my installation, the SWR was never worse than 1.9:1 at the band edges.

If your rig's output circuit has trouble dealing with the SWR, use a tuner. Or, if you can source some 90–100 ohm coax, that would make the match right on the money. As previously stated, perfection in this project is not a requirement.

For those who are interested, the results were very satisfying. The first ten days produced 44 countries. After five weeks, I had logged 81 countries. In a little over a month, I logged more than I had in the previous year and a half.

The rig I use is a Kenwood TS-430S, which I run very lightly — about 60W–70W.

The antenna was installed with north/south orientation. The pattern should favor east-west, but I made a number of contacts off the ends. There appears to be no null or, at best (or worst), very narrow.

So, there you have it. A cheap and dirty antenna to work the world. This antenna worked almost enough stations to get my DXCC.

Continued on page 57

Dr. David Babulski N4XVF
2677 Colony Circle
Snellville GA 30078

Way Cool Rocket Project — Conclusion

This 70cm rocketborne radio telemetry system is strictly for kids — NOT!

So far in this series of articles, you have learned how to build the telemetry transmitter, receiver, and telemetry-tracking antenna, and you have learned how to modify the rocket airframe to house the telemetry electronics. In this last in the series of articles, you will learn about calibration of the temperature sensor, launch operations, telemetry data recovery, and data analysis.

A sensor calibration table must be created in order to effectively analyze the received telemetry data. In the case of our Sounding Rocket 101 system, the telemetry data is composed of variable width audio tone pulses. The width of the audio tone pulse is directly proportional to temperature. In order to generate a calibration table, the payload section of the rocket, along with the sensor, must be subjected to a range of known hot and cold temperatures, and a record made of the sensor/transmitter signal in response to varying temperature. The easiest way to accomplish this is to build a small, insulated calibration chamber that will house the rocket payload. I used a small Styrofoam ice chest as the calibration chamber. See **Photo A.**

The chamber is fitted with a 40-watt ceiling fan light bulb as a heat source, and a small fan to move air within the chamber to prevent stratification of temperature within the chamber. Both the fan and light bulb are powered by 115 VAC and are placed on separate switches. **Fig. 1** is a schematic of the heat source and fan for the calibration chamber.

To build the calibration chamber, first mount the light bulb, fan, and switch box to the cover of the Styrofoam ice chest. I used a Leviton Model 632-8829-CW4 keyless plastic lampholder. This was fastened to the inside of the ice chest with 6-32 x 4-inch hardware. Make sure to use washers on the Styrofoam side to prevent the nut from deforming the soft Styrofoam. The fan I used was purchased at

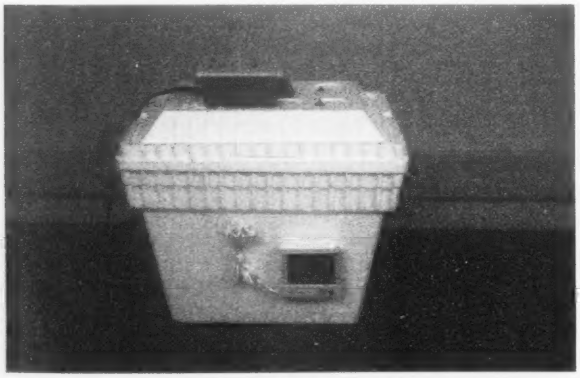

Photo A. *The completed Sounding Rocket 101 temperature calibration chamber, showing the thermometer readout in place on the mounting bracket.*

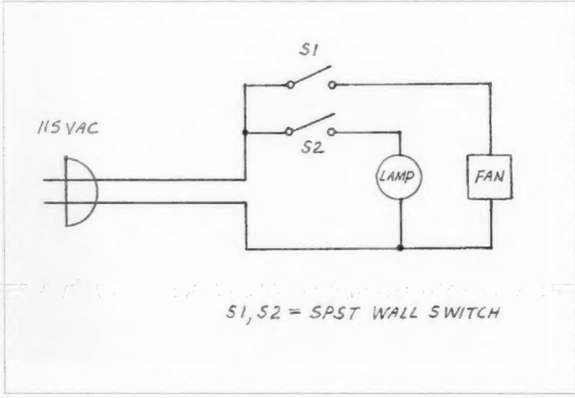

Fig. 1. *Schematic of the heat source and fan for the calibration chamber.*

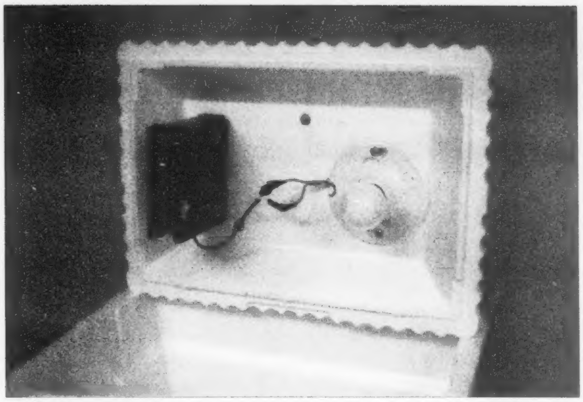

Photo B. *Light bulb and fan mounted to the inside of the ice chest lid.*

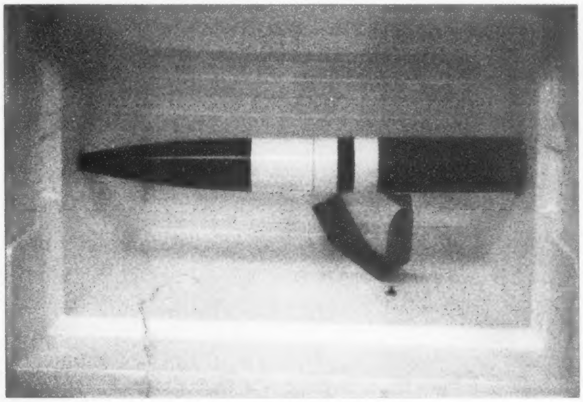

Photo C. *The payload section of the rocket in place within the chamber.*

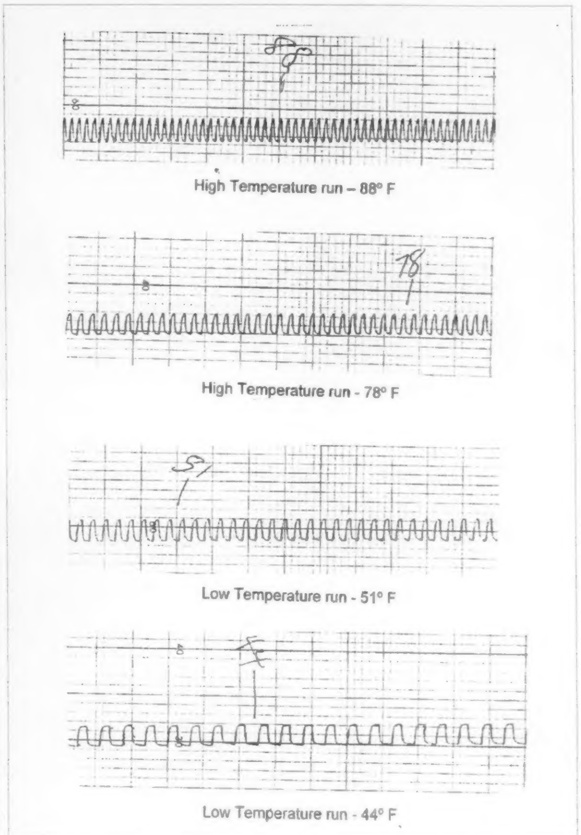

Fig. 2. *Sample strip chart output from both the high and low temperature calibration runs. The strip chart recorder used with this project was a Perkin-Elmer R50 single channel servo-type recorder.*

a flea market and was fitted with two mounting holes tapped for 6-32 hardware. Depending on the fan you use, you may need to suspend the fan from the inside of the ice chest lid with metal or plastic straps as in **Photo B**.

Measure halfway down on the side of the Styrofoam ice chest and make a mark. Center the end of the rocket airframe on the mark and carefully draw around the end of the airframe. Use a sharp hobby knife to cut out a circle just inside the circular mark delineating the end of the airframe. Next, slide the rear portion of the payload section of the rocket into the circular opening you just cut out. It should be a bit of a tight fit. Position the payload section in the chamber so that it is parallel with the bottom of the chamber. If your chamber is small enough, you can support the front, or nose cone end, by pushing it into the Styrofoam slightly to form a small divot. This will adequately support the forward portion of the payload section. If you are using a larger chamber, you will need to install a support for the front portion of the payload. **Photo C** shows the payload section of the rocket in place within the chamber.

Temperature measurement is accomplished with a Chaney Instrument Acu-Rite Model 00884 digital LCD display indoor/outdoor thermometer. The outdoor sensor is mounted to the inside wall of the calibration chamber. The unit I used is supplied with a small mounting bracket that is attached to the front of the chamber. The thermometer readout is then attached to the bracket (**Photo A**).

To operate the calibration chamber, the payload section is placed in the chamber with the transmitter-enabling plug removed. This will activate the transmitter. The chamber lid is put in place and the receiver, decoder, and strip chart recorder are placed a few feet away from the chamber. Power is applied to the digital thermometer. Next, the fan switch is turned on, followed by the lamp switch. Ensure that the strip chart recorder is displaying the received telemetry signal on the paper. Carefully note the digital temperature display. For each two-degree rise in temperature, make a note of the temperature on the strip chart record. Continue this process until you have recorded the telemetry signal through a temperature of 100 degrees F. Turn off the strip chart recorder, receiver, fan, and lamp. Open the chamber to reinstall the transmitter-enabling plug. This will turn off the transmitter. Allow the entire calibration chamber to cool back to room temperature. Fill the bottom of the calibration chamber with 2 inches of ice. Turn on the receiver and strip chart recorder. Apply power to the digital thermometer. Pull the

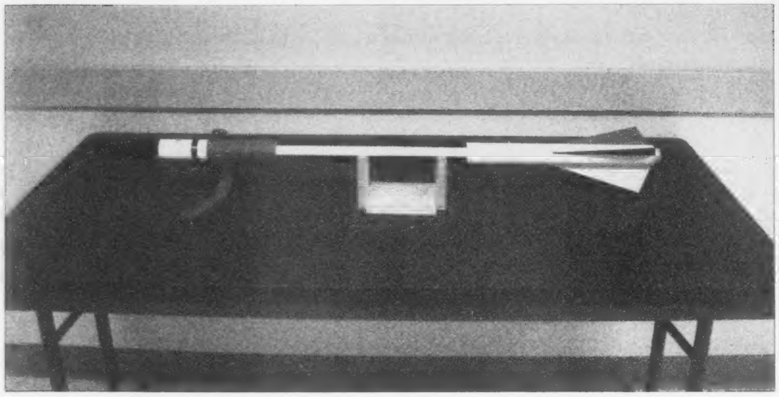

Photo D. Ready for launch.

Photo F. The powered ascent.

transmitter-enabling plug to apply power to the telemetry transmitter. Place the lid on the chamber and turn on the fan. Do not turn on the lamp. As you did with the high temperature run, make a note of the temperature on the strip chart record for every two-degree temperature change. Continue the low temperature calibration run until chamber temperature reaches 32 degrees F. **Fig. 2** shows sample strip chart output from both the high temperature and low temperature calibration runs. The strip chart recorder used with this project was a Perkin-Elmer R50 single channel servo-type recorder.

A useful tool to assist in reduction of flight telemetry data is a transparent plastic scale calibrated into pulsewidth vs. temperature values. This tool is of particular value if you will be working with schoolchildren with this telemetry project. Children can become frustrated very quickly trying to accurately measure each pulse record on the strip chart. By using the gauge, they can more quickly measure the telemetry temperature values. Now that the telemetry sensor is calibrated, it is time to fly the bird and gather data.

Photo E. The rocket at liftoff.

Flight operations

To enhance optical tracking of the rocket, I recommend painting the rocket in a high-visibility color scheme. **Photo C** shows one possible paint scheme. Black and white patterns with fluorescent orange were selected as experience has demonstrated this combination to yield high visibility at altitude.

This is an important step, as under power of the recommended Aerotech G35-7W rocket motor, the rocket will reach an altitude of over 2,000 feet. Beyond about 1,000 feet, the rocket will disappear. You want a high-visibility color scheme to allow for optical re-acquisition as the rocket descends under its recovery parachute. The change in physical geometry at apogee when the parachute is ejected will usually catch the eye. In descent mode, the rocket is a much larger object and is easier to optically track if it appears in eye-catching colors.

Of equal or greater importance is installation of fresh batteries in all the project electronics. In the transmitter, make sure to secure the 9-volt battery to the transmitter circuit board with a length of wire or string along the long axis of the battery, and with a length of electrical tape about the short axis of the battery. Once all the batteries are in, it is always a good idea to ground check all the electronics before leaving for the launch site. Make sure that the transmitter-enabling plug is in place on the rocket payload section. This plug will be removed just before launch to turn on the telemetry transmitter. If you will be videotaping the launch, make sure the camera battery

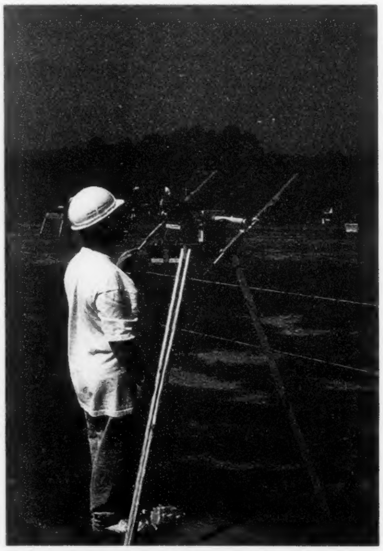

Photo G. Author N4XVF operating the telemetry tracking station.

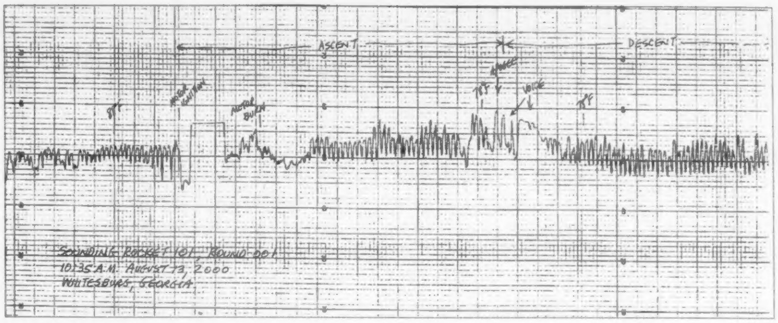

***Fig. 3.** A portion of the telemetry record from launch to apogee and the beginning of the descent phase.*

is fully charged the night before the launch.

This project is a complex one and should not be attempted alone. If you need to, contact the National Association of Rocketry for the location of local rocketry clubs. I have always found rocketry hobbyists to be eager to help, particularly with an interesting project such as this one. I recommend the following minimum launch crew complement:

- Two optical trackers. These crew members will follow the ascent of the rocket to apogee and record the angle of the rocket with the horizon. These recorded angles are used with simple trigonometry to determine the altitude of the rocket. This is an important measurement, as the telemetry data is of little use if you don't know where it was measured.
- One videotape cameraman. I have found it very useful, particularly with middle school–age children, to integrate the videotape with the strip chart record. This drives home the idea of where the data was measured. This crew member will videotape the entire flight from launch to touchdown.
- Telemetry Tracking Station Operator. This launch crewman operates the telemetry receiver and recorder and steers the tracking antenna to follow the rocket in flight.
- Recovery Crew. It is the responsibility of these crewmen to retrieve the rocket and reinstall the enabling plug in the transmitter payload to turn off the transmitter.
- Launch Control Officer and Range Safety Officer. These personnel are adult members who are experienced rocket hobbyists. They are responsible for range safety and electrical ignition of the rocket motor.

Sounding Rocket 101, Round 001, described in this series of articles, had

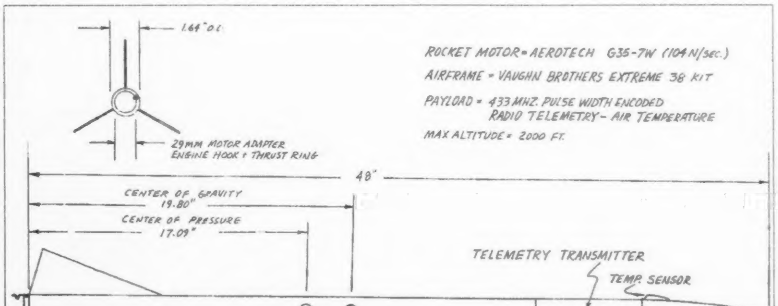

***Fig. 4.** Basic engineering data for Sounding Rocket 101, Round 001.*

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2.40" square x 0.13" thick epoxy-encapsulated silicon photovoltaic panel removed from solar lighting system. Solid, almost -unbreakable module with easy-to-solder spots on backside.
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Each cell is 1.8" x 0.65" x 0.3".
With little effort you can remove the cells from the enclosed battery pack and reconfigure them to suit your needs.
cut-away view
CAT# NMH-53
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CAT # HLP-50
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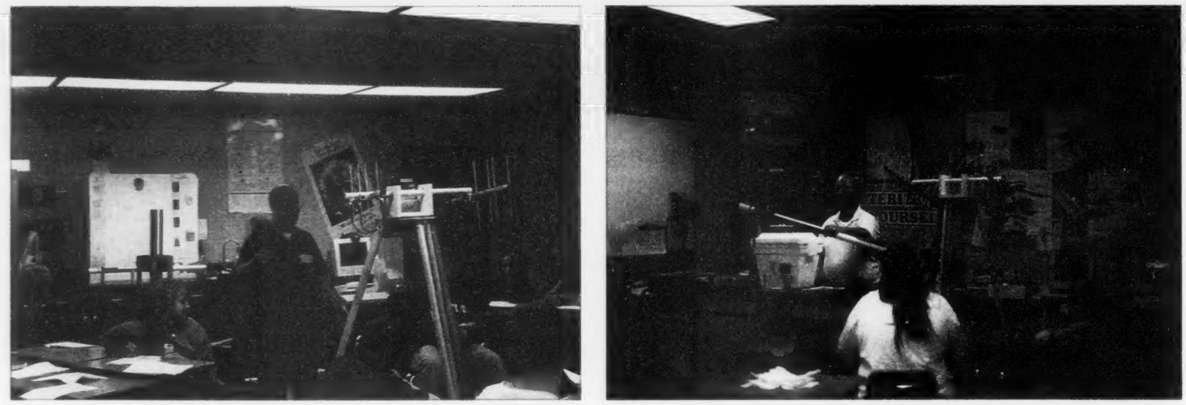

Photo H. *Not afraid to preach what he practices, N4XVF is a much appreciated classroom crusader.*

its initial flight on August 13, 2000, from a three-rail launch tower of my own design at pad 24 on the Southern Area Association of Rocketry range located near Whitesburg GA. The telemetry transmitter was enabled at 10:30 a.m., with rocket motor ignition occurring at 10:35 a.m. The rocket reached an altitude of 2,200 feet. The 433 MHz telemetry system performed perfectly, with solid received signal during the entire flight profile. Total flight time from launch to touchdown lasted two minutes. See **Photos E** and **F**.

Careful examination of **Photo G** shows the addition of a Ten-Tec audio amplifier and an additional shelf to hold the audio tape recorder. The Ten-Tec amplifier was used to boost audio output of the receiver to more effectively couple to the audio recorder. For this flight I elected to run the audio recorder in loose-coupled mode to capture sounds from the range as well as the telemetry data signal.

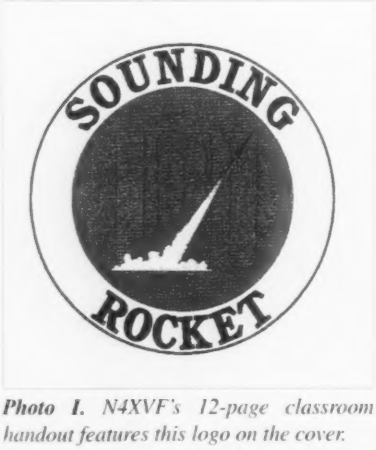

Photo I. *N4XVF's 12-page classroom handout features this logo on the cover.*

Once the telemetry data is recorded on audiotape, the next step is to run the audio signal through the frequency-to-voltage converter and print out the data on a strip chart recorder. Once the data is printed out, measurements can then be made to determine the recorded temperature.

Surface weather conditions at the time of launch were clear sky, sunny, with wind at 4 mph from the southeast. Data from the flight of Sounding Rocket 101, Round 001 showed ground level air temperature to be 88 degrees F, with an air temperature of 78 degrees F at 2,200 feet. This measurement is very close to the predicted dry adiabatic lapse rate of 5.4 degrees F temperature decrease per 1,000 feet. **Fig. 3** is the portion of the telemetry record from launch to apogee and the beginning of the descent phase. (The chart record for the entire flight is about four feet long, much too large to include in this article!)

Some may question why digital techniques were not used to record the temperature data. The answer here is the additional educational value of requiring the student to measure, plot, and graph the temperature data points. It could be argued that it would be easier to record temperature measurements directly to onboard RAM and read it via software directly to a screen graph. However, much more knowledge and skill are learned by reducing the recorded telemetry data the long way. A challenge to more advanced students is to write a software program that would use the recorded audio pulse width telemetry data to generate a temperature vs. altitude graph on the computer screen. For those readers who may wish to duplicate this project, please refer to **Fig. 4**.

I am developing a small curriculum package directed at 6th- 7th-, and 8th-grade Earth Science students as a companion to the Sounding Rocket 101 project. This curriculum package will be used with a volunteer Sounding Rocket 101 program and middle school Earth Science students in Georgia. Those readers who are interested in this curriculum package or the Sounding Rocket 101 project are encouraged to contact me via E-mail at [dbabulsk @lanier.com], or via snail-mail.

Continued on page 57

Qty.	Description
1	Styrofoam ice chest with dimensions 12 x 8 x 15 inches or similar
1	Dual switchbox with dual switch cover plate
2	SPST wall switches
1	115 VAC muffin-type fan
1	AC power cord
1	Chaney Instrument Acu-Rite Model 00884 LCD display indoor/outdoor thermometer (found at garden stores or variety centers)
1	40 W ceiling fan light bulb (Phillips #BC40A15/FAN)
1	Leviton Model 632-8829-CW4 keyless lampholder
As required	#12 solid copper insulated wire

Table 1. *Parts list for the calibration chamber.*

Donald E. Koehler KL0XK
P.O. Box 6382
Elmendorf AFB AK 99506
[tecimgak@gci.net]

Disaster Overkill

Say what you want about this ham's response to emergency preparedness — until you need him, that is.

Disaster communications — I'm sure this is a subject every ham gives at least some thought to from time to time. The real question is how prepared are you — right now or on very short notice — to provide emergency communications? You should be able to go beyond a handheld 2m FM rig and some spare batteries. And most of us cannot afford or have no need for a military surplus 6X6 with an equipment shelter on the back. This article looks at how one ham — Thomas G. Eggers N3JNJ — is set to go, and what he has done to provide emergency communications literally at the drop of a hat. In addition, he has done this on a reasonable budget, one that you might do well to emulate.

First, let me make a confession. Here in Alaska, if you have an HF rig mounted in your car, the state will waive the registration fee (some restrictions apply). Even with this incentive, I do not have my 4x4 rigged to carry a radio. I do have battery boxes, solar panels, and a GRC-9 and GRC-47 in their transit cases and ready to go — and even take them out to use at Field Day and our club BBQ. Available? Yes. Ready? No. Since I don't own a travel trailer or motorhome, what Tom has done makes sense for me and, I suspect, a lot of other hams. Just what is it that Tom can do that is so impressive?

Well, he can back up his Jeep and latch onto an impressive array of equipment and camping gear — always ready to go. Tom is retired from the Air Force, and while on active duty, spent many years as a professional radio maintenance technician in the field. He understands first-hand the problems that crop up when you are out of the shack and working high volume traffic. He has taken an inexpensive trailer kit and built an impressive communications center. It is worth some time to exam closely *what* he has done and the *why* behind it.

To begin with and provide a basis for comparison, we can define the problem(s) of field communications support as ones of transportation, setup/operation, and field logistics support. Each of these areas must be addressed for the amateur or professional operator to be successful in providing critical communications to emergency services crews.

The problem of transporting equipment can be further defined as transportation, protection, and use once you

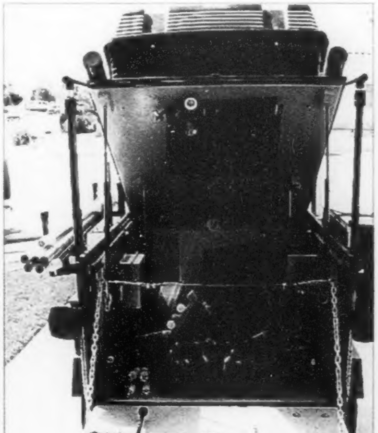

***Photo B.** Rear of system, open. Note storage of fuel, antennas on top, and tailgate as work area.*

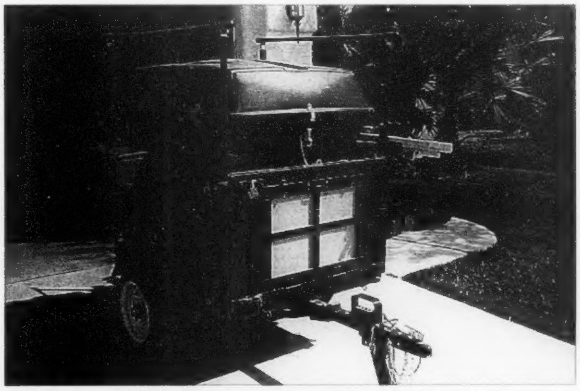

***Photo A.** Communications center trailer, starboard side.*

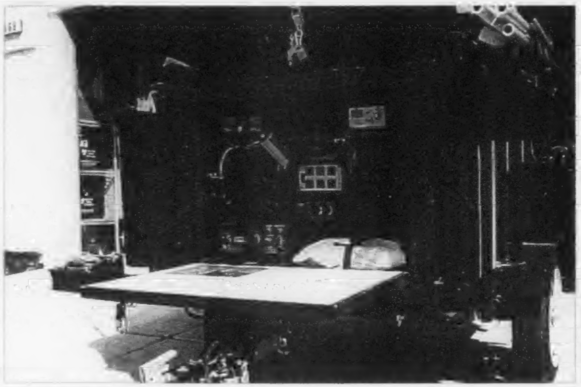

Photo C. *Front of system, open, showing installed equipment and operator table.*

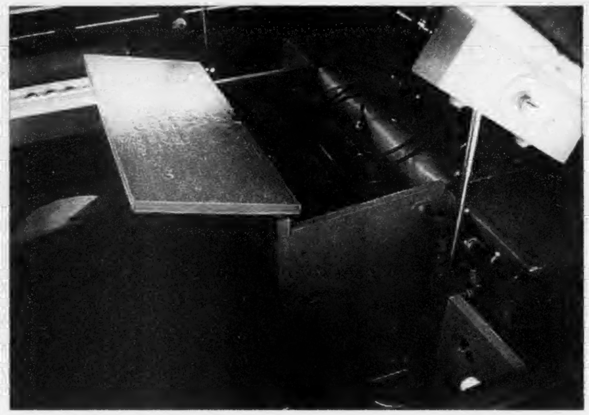

Photo D. *Interior shot showing battery and power filters.*

have arrived at your communications point. In the transport phase, you must provide protection for your equipment from the elements, mechanical (vibration) damage, and temperature/dust/humidity. In my case, the use of mil-spec radios and transit cases provides what could be considered excessive protection — after all, I doubt I'll be jumping out of perfectly good airplanes again any time soon. On the other hand, the transit cases do allow me to put the equipment into my open utility trailer, next to the genset, and take off.

In Tom's example, he has, I believe, reached a very good compromise. If you look at the trailer in **Photo A**, you see that the front appears solid. This front piece, in fact, folds

N3JNJ
Communications Trailer Equipment Listing/Inventory: Radio/Computer

Radio Equipment
Transceiver, UHF/440 MHz (Yaesu FT-712RH)
Transceiver, VHF/2m (GE MV5)
Transceiver, HF/2–30 MHz (Kenwood TS –130S)
Transceiver, CB/11m (Midland Model 77-112)

Associated Radio Equipment
HF ThruLine Watt/SWR Meter (Dentron SWR-1A)
HF Antenna Tuner/Matcher (Kenwood AT-130)
HF Antenna Tuner/Matcher (Dentron Jr.)
HF Band Pass Filter
In-line Lightning Arrestor
CB/11m Antenna Tuner/Matcher (Home Brew)
VHF/2m ThruLine Watt/SWR Meter (MFJ Model MFJ-812B)
External PA Speaker with Mag Mount and 30 feet of cable
External Speaker HF
External Speaker VHF
External Speaker UHF
External Speaker CB

Optional Equipment
Laptop Computer, Toshiba Model T1100 Plus
Packet Pallet (Lazy-Susan type) set up for use with HT/Hand-Held Radio (includes: All-Mode Kamtronics Kam/TNC, 35 Watt RF Amp, Power Distribution Box, and Audio Output Adapter Box)

N3JNJ
Communications Trailer Equipment Listing/Inventory: Antennas

Antenna Mounts
1 ea. VHF Sectional Mast (Military GRA-4 type)(bolted to left front side of trailer)
1 ea. Aux Mount (Military GRA-4 type)(bolted to the right front of trailer)
1 ea. UHF Sectional Mast (Military GRA-4 type)(bolted to the right side of the trailer tailgate)
1 ea. HF (Military NVIS type) Base Mount (bolted to the left side of the trailer tailgate)
1 ea. HF Ball Mount (bolted to the left side rear of the trailer)
1 ea. CB Ball Mount (bolted to the right side rear of the trailer)

Antennas
440 MHz, 1/2-Wave Vertical (Base Loaded)
VHF/2m Full Wave Vertical (Center-Loaded with Ground Plane Elements)
VHF/2m 3-Element Beam
VHF/2m 5/8-Wave Vertical (Base-Loaded with Mag Mount)
CB/11m Fiberglass Vertical (72-inch/6-foot, Top-Loaded)
HF/NVIS, Dual Inverted-V Dipole
HF/V-type (Hustler Stingers and Extension Rods)
HF/Telescoping Vertical (168-inch/14-foot)
HF/Screw together Vertical (231-inch/19-1/4-foot)(Mounts to top of military GRA-4 type Driven Mast)
HF/Horizontal Dipole (Hustler Stingers and Extension Rods)(Mounts to top of Military NVIS Mast)
Spare HF Mast Sections (12 ea. of Military GRA-4 type)

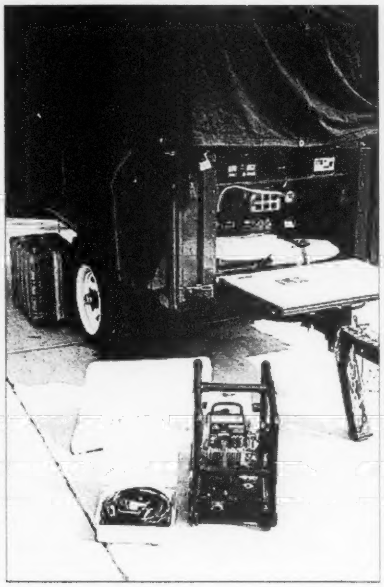

Photo E. *Genset and DC cable set for battery recharge.*

down and reveals several mounted radios, a laptop, TNC, and (a nice touch) a reading lamp. It seals against the rest of the trailer assembly and provides protection from the elements during the ride to the site. Once at the site, the "door" is opened and becomes an operating table. The equipment mounts are "soft," so road vibration is minimal, and the rigs are all mobile gear and thus designed to handle what little does get through.

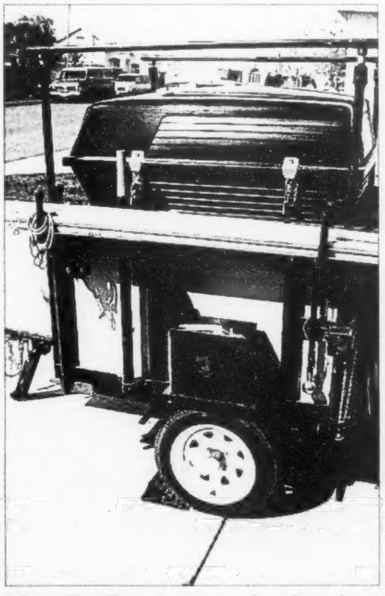

Photo F. *All tenting stowed and ready to travel.*

Setup and operation of equipment must be, as much as possible, defined in advance. Working in the rain, for example, is no fun, and trying to use non-mil-spec equipment in the rain would be a disaster of its own. Tom has designed his trailer to take advantage of his Jeep's tailgate setup. He can open the back hatch, which then extends over the operating table — a neat layout. If the weather gets really nasty, he has a tent that can be attached.

Examine the trailer in **Photo G**. The support structure allows tenting material to attach to the trailer and extends to one side. This will allow you to operate and cook/snooze or hang out — in the shade or out of the rain. The tent is stored in the interior of the trailer while in transit. This setup allows

Continued on page 26

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N3JNJ
Communications Trailer
Equipment Listing/Inventory:
Power/Test/Camping

Power Equipment

12 VDC Marine, Deep Cycle, 90 Amp-Hour Battery (includes: 2 in-line power filters/capacitors and dual cutoff switches)

12 VDC to 110 VAC Power Converter, 3500 Watt (includes: 6-outlet power strip located in the radio compartment)

110 VAC battery charger (backup to generator when 110 VAC is available)

Generator, AC / DC, 350 Watt, 2 Cycle (Chicago #35286)(includes: 50-foot AC Output Cord, 50-foot DC Output Cord, Canvas Cover, Output Volt/Amp Meters, Spare Parts, Hand Tools, Protection Cage/Home Brew PVC)

Test Equipment

AC/DC Multimeter with assorted leads

Bird ThruLine Wattmeter with assorted elements, cables, and adapters

Camping Equipment

1 ea. Tent (with 10-by-10-foot groundcloth)
2 ea. Sleeping Bags
1 ea. Full-Size Air Mattress
1 ea. 12 VDC Air Pump
1 ea. Air Pump (foot-operated)
1 ea. Camp Stove (2-burner, white gas)
1 ea. Camp Lantern (2-mantel type, white gas)
1 ea. Wash Pan (for cleaning up)
1 ea. Plastic Container with Cooking Utensils (Frying Pan, Pot, Knives, Forks, Spoons, Spatula, Salt/Pepper, Lighter for stove and lantern, Paper Plates, Dishwashing liquid, Paper Towels, 1 Roll Toilet Paper)
1 ea. Portable Table (with adjustable leg length)
1 ea. Folding Chair
1 ea. Propane Heater

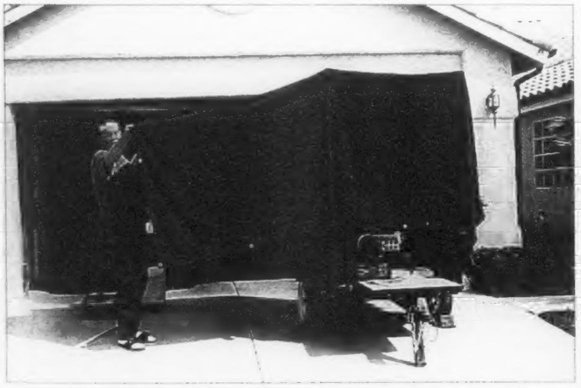

Photo G. *Tom is holding out the tent (normally this is guyed off to a set of stakes). You can see how much cover this will provide in the field.*

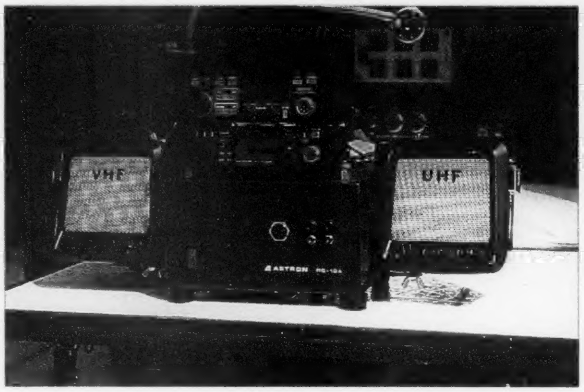

Photo H. *Flyaway rig, with wing speakers, power supply, and diplexer. It's all here and ready to go!*

Disaster Overkill

continued from page 25

maximum flexibility for field setup based on the specifics of the site.

Setup and operation of the communications center is very clever in both its simplicity and ease of use. You can literally pull up, park, set up a mobile antenna, and start to operate! The radios are mounted and covered in transit. Once on site, the operating "desk" is lowered and the battery switch is thrown to ON. Tom has mounted a battery and permanently wired in all of the radios and computer equipment. The antennas are fed back out to a set of bulkhead connectors which allow the use of either mobile type antennas or full-size, high-gain antennas. He has HF antennas from Hustler and a NVIS ground mount system, plus VHF and UHF antennas which will work off the trailer or Jeep.

Power to the battery is supplied by a small DC-only genset. This allows operation of the radios without a generator yammering away day and night. The generator is sized so that 90%+ of the DC goes to recharge the battery bank. Tom has modified the generator with a cage, set of meters, and a cover for protection when not in use. I suggested he consider adding a couple of solar panels. In southern Nevada

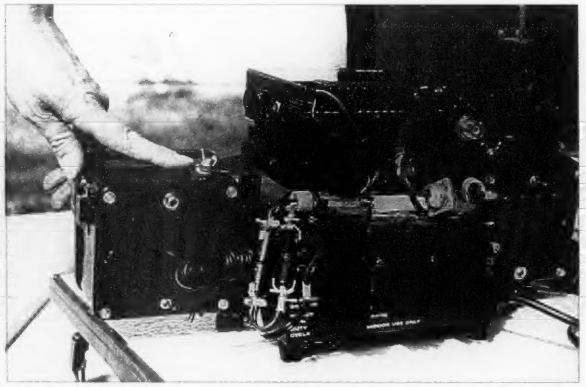

Photo I. *Detail of wing speaker — wing nuts mean no special tools are needed.*

N3JNJ
Communications Trailer
Equipment Listing/Inventory:
Miscellaneous

Misc. Items

Ground Rod for Central Ground (with insulated wire)
Lug Wrench (for wheel lug nuts)
Bottle Jack (for jacking up trailer to change wheels/flat tire)
Spare Tire (mounted to the trailer tailgate, includes cover)
Spare Hardware, Fuses, Lamps, Wire, and Connectors (stored in ammo can mounted to left side of trailer)
12-by-12-foot Canvas Tarp (includes support poles and guy ropes/stakes)(for covering trailer and equipment during operation)
12 VDC Goose Neck Lamp (installed in radio compartment, used during operation)
Fuel Can for Generator (2-Cycle Mix)(2 Gal.)
Fuel Can for Stove and Lamp (White Gas)(2 Gal.)
Jerry Can (Water)(6 Gal.)
Distilled Water Bottle (for battery)(1 Gal.)
6 ea. Spare Propane Bottles
Misc. RF Cables, Guy Ropes, Guy Rings, Stakes
Small Sledgehammer

Misc. Installed Items

3 ea. Antenna Bulkhead Feedthrough Connectors (S0-238 Type)(1 for VHF, 1 for UHF, 1 for HF)
2 ea. DC Power Bulkhead Feedthrough Connectors (Female Banana Type)(1 Red and 1 Black)
1 ea. Counter Poise Bulkhead Feedthrough Connector (Female Banana Type)(1 Black)(installed below HF Ball Mount on left rear of trailer)
1 ea. Ground Lug Connector (used to connect central ground)(installed on the front left corner of the trailer)
1 ea. Backup Light (installed center rear, below the tailgate)(used for the times when you have to back the trailer at night. The vehicle backup lights are usually blocked and are not of much use)
1 ea. DC Power strip (4-output)
1 ea. HT mount (mounted to front right side of trailer)
1 ea. Battery Pack Hanger (mounted to front right side of trailer)
2 ea. Spare Mast carriers (Y-type, mounted to left side of trailer)
2 ea. Antenna Transport Tubes (mounted to top of trailer)
1 ea. Luggage Carrier (mounted to top of trailer, used to carry camping equipment)
1 ea. Trailer Light Indicator Box (used to indicate good input to trailer lights, mounted on trailer tongue)

where he lives, the sun will provide enough current to really cut down on generator use.

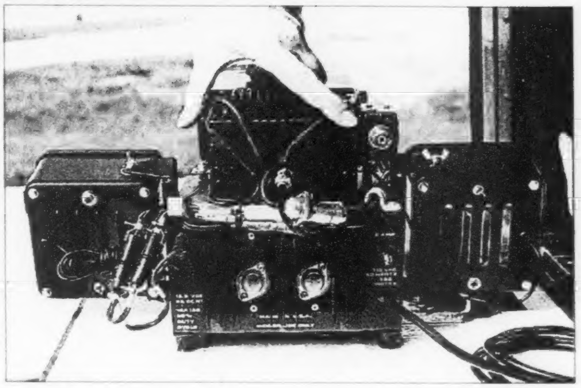
Photo J. *Diplexer port. A single run of coax and one antenna saves space and tempers when setting up in a command post area.*

In addition to the trailer-mounted equipment, Tom has a small communications package set up in a "flyaway" format where a VHF and UHF rig are mounted on a suitable power supply. These then pack in a small case with cables, mikes, and all else you need to operate a small line-of-sight station. A companion roll carries antennas and cords, etc. It does require a source of steady AC power, but has the advantage of being a sweet "command post" rig setup. Walk in, plug in, string a set of coax cable, plug in the antennas, and you are set to go. The fold in/out speakers are a nice touch. I almost always use a set of cans — it cuts down on the noise and confusion, and permits a degree of privacy.

Field logistics support is more than trying to find a rent-a-can and enough clean water to make coffee. Tom has set his

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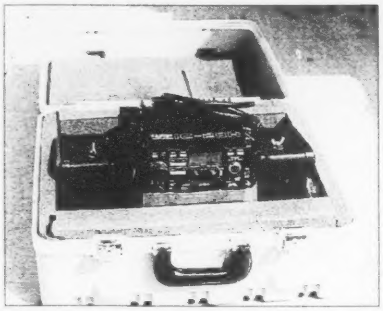

Photo K. Flyaway kit in transit kit. Padded, waterproof, and ready to go.

rig up to provide shelter; water and fuel storage; and cooking facilities as part of the basic package. A set of cots, sleeping bags, some 5 gallon jugs of water, and you have the advantage of being self-contained. I personally hate to cook while in the field, unless that is the reason for being out. Between Meals Ready to Eat, "Heater Meals," and granola bars, I am all set. I do carry a small stove for heating water. Tom has set his outfit up one better, with a two-burner gas stove. This allows for cooking at a comfortable height and out of the weather. In whatever you choose to do for cooking, don't forget to plan for a way to wash up and clean hands, pots, and dishes. Tom has set his storage areas up to fit inside/on top of the trailer.

I plan to and can go completely self-contained for at least 72 hours – and even at that, the only "refill" is for potable water and gasoline. I have spent considerable time in the Alaskan "bush" and in the field with the military — and have developed a style that works for me in remote areas. Not everybody is the same. Take the time to decide what you will want to carry and do a complete pack out. Then go use it in a *non-emergency* situation — Field Day comes to mind as a perfect excuse to exercise your plan. Standing in the rain with people desperate to communicate is no time to find out your cables don't fit, you need an extra plug for the headphones, or are missing the special cable you left back at the shack. And don't forget the spare fuses, tool kit, etc.

The trailer equipment lists are in the sidebars. Not everyone will have a need, nor the desire to build, an allband (HF to UHF) outfit like Tom. Not everybody collects mil-spec communications equipment as a hobby. Perhaps a smaller flyaway kit reflects your needs or requirements. In any case, even if you leave your rigs in the shack, a pre-wired and -tested transport/operation outfit will allow you to save time, protect your equipment, and, when the real thing hits, maybe even save some lives. Thanks to Tom, I am working on my new field rig right now.

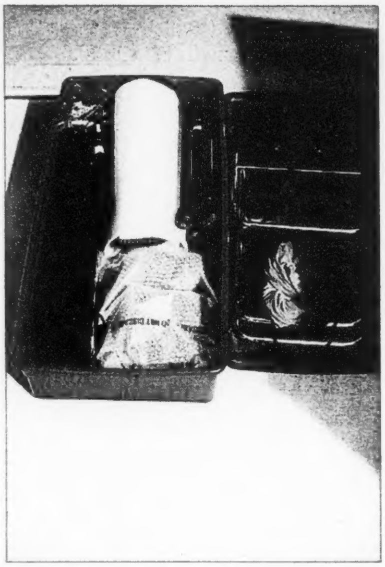

Photo L. Antenna and cable roll is part 2 of the flyaway kit. You can carry this onto a commercial airliner and be ready to operate 10 minutes after arrival.

Tom Eggers N3JNJ, the subject of this article, can be reached at [tomsprint@earthlink.net].

Photo M. Deployed and ready.

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Bookbind THIS! — Part 2

Get organized, and save money, too.

Part 1 of this series on bookbinding techniques discussed the need for hams to save valuable technical information by binding it into single annual volumes and to recover some needed shelf space in the process. A listing was provided for the materials and tools that I've found useful in making the process successful.

This part will discuss the typical types of bindings used by popular publications that a ham is most likely to encounter, along with separating pages and suggestions for thinning out the volume, and ending with a discussion of the binding fixture.

Binder types

There are several methods that publishers use to bind their magazine issues. I'll describe three of them and indicate the techniques that I use for extracting the pages from each.

Saddle-stitch

73 Amateur Radio Today uses a saddle-stitch technique where all of the double-size pages of the issue are stacked and stapled along the stem, then folded on the stem. Taking the issue apart requires pulling the staples (see **Photo A**) and cutting the double page along the center of the stem, then stacking the pages in page order. Each issue will then be an individual stack of pages and appear as shown in **Photo B**.

The process that works for me after the staples have been pulled is to place the issue opened up fully with the cover and back facing upward and on top. The cover and back are lifted and cut apart, making two individual pages. Those two pages are then laid onto the table (cover face down, rear of back facing down), with the cut stem of each facing one another — as if the issue were merely opened up fully. As each additional page is cut, it is laid onto the respective stack until all pages are completed. The last step is to pick up the "rear" stack and lay it onto the "cover" stack such that all pages are again facedown and in the proper page

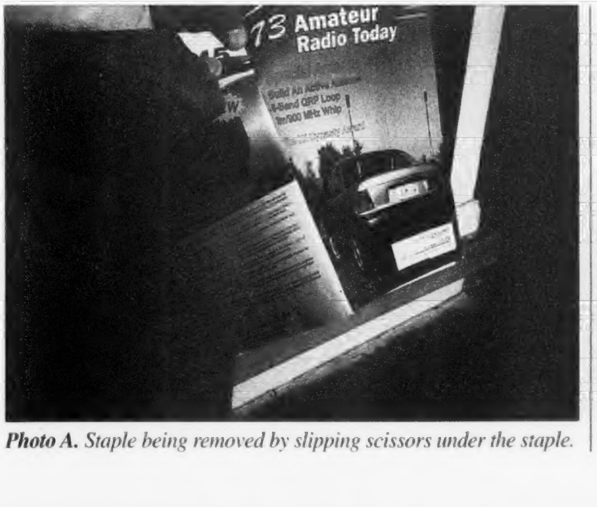

Photo A. *Staple being removed by slipping scissors under the staple.*

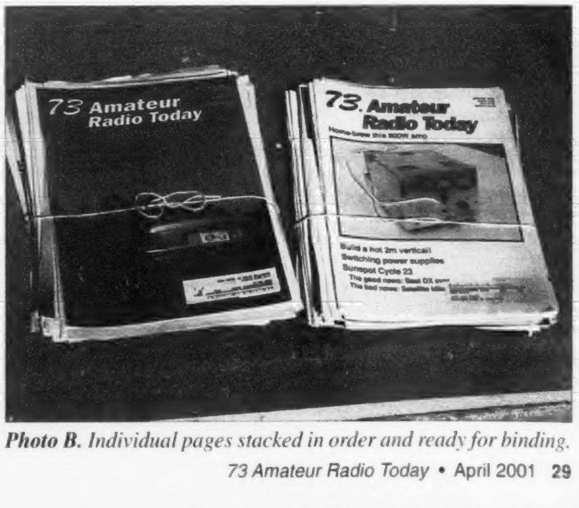

Photo B. *Individual pages stacked in order and ready for binding.*

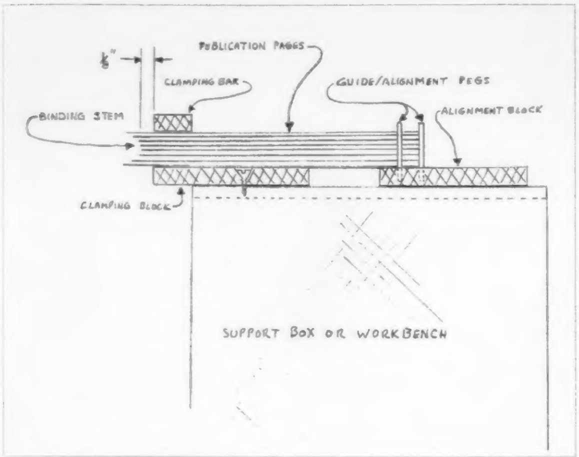

Fig. 1. Clamping and fixturing details.

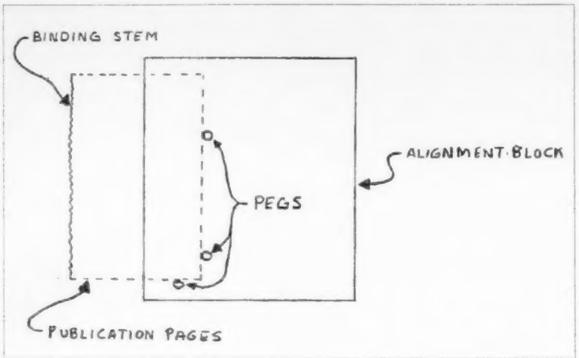

Fig. 2. Top view of guide/alignment pegs and alignment block.

order. Move the stack, cover down, to the side where the next issue in line will be placed on top of it, until the annual publication volume resides in a single stack with January on the bottom and December on the top.

Glued stem

A common technique used for holding a thick volume together is to stack the individual pages and apply glue to the stem, then add a cover — which is the basic technique that will be described herein for ham use. This is a form of "perfect" binding (as is the one below), which means that the cover and pages are held together with adhesive.

Taking the glued stem issue apart requires more effort than that required for a saddle-stitched issue. The process that I've found to be effective is to open the issue to the approximate center, then grasp the two sections, one in each hand, and pull them apart, separating the sections at the stem.

NOTE: Care must be taken because it's possible to tear a corner section out of a few pages.

Once separated into two sections, the magazine sees its back half laid aside temporarily while the front section is taken apart page by page. The cover is opened from the bulk of the pages and carefully pulled away from the glued stem. It is then laid face down. The next page, or two, can be removed by pulling it from the stem. The last few remaining pages may retain the bulk of the original glue. If the pages are to be eventually saved, the glue will have to be stripped off. I've found that it's easily removed by pulling on it with fingernails used as a tool. Tougher situations may require the judicious use of scissors to remove the glue without sacrificing the paper's edge.

As each page is removed it is laid onto the stack until all pages are completed. All of the pages are again in proper page order. Move the stack, cover down, to the side where the next issue in line will be placed on top of it, until the annual volume is complete in one stack with January on the bottom and December on the top.

Bound multiple saddle sections

If you've ever looked at the "construction" of a hardbound book, you'll notice that because of the thick volume, small sections of the book are folded at the stem, then stacked with other such sections. The "book" is then made up of a series of stacked saddle-stitched sections bound together to form a complete book.

Some soft cover publications are also made up of the multiple saddle sections. Once assembled, the stack is "side" stapled through all of the sections. A paper cover is then glued over the stack.

Taking the issue apart requires first removing the cover and back, and then pulling the staples. Care must be taken to keep the individual sections in order as they are cut into individual pages. If care is taken, the numbering will be correct after all of the pages are restacked.

Once all of the pages are again in proper page order, move the stack, cover down, to the side where the next issue in line will be placed on top of it, until the total annual volume has been completed with January on the bottom and December on the top.

Thinning the annual volume

Now is the tricky part, because it is necessary to make some very tough decisions on what to save and what to discard. Here is the way I approach the situation. I start by turning over the entire stack, placing the January cover on top. Turning one page at a time, as if reading the book, I place the cover face down as a first step. On top of it I place the table of contents for that issue, followed by the articles that I wish to save. The saved pages remain in page order as the sorting process continues. It is important to also save the pages containing the continuation of each saved article. To save shelf space, I discard the rear cover of all issues except for December, the last issue and page in the stack. Be sure to save the annual index, should one appear within the volume.

Binding fixture

This is an area of the process where you must draw upon whatever tools and equipment are available. In my case, I happened to have a large wooden packing box that I use as a binding table. Most any stand or workbench will be suitable if it is convenient to use.

To accommodate various page sizes, I've used two pieces of wood of equal thickness (**Fig. 1**). One is a clamping block that is affixed to the stand/workbench. This block is longer than the longest page that will ever be encountered — mine is about 12 inches long.

Residing behind the clamping block is a guide/alignment block as shown in **Figs. 1** and **2**. On the block are three pins that may be either wooden pegs or large nails that are positioned with a square. These pins are used to align all of the loose pages into a neat stack prior to binding. Alignment needs to be done on only the front edge and one end of the page. Because the various monthly issues are cut at different times, there will be a small variation in the page length and width, leaving one edge of the newly bound volume a little "ragged."

When placing the loose pages onto the binding fixture, it is first necessary to lay down, for alignment, the narrowest page within the stack. As shown in **Fig. 1**, the narrowest page(s) should extend beyond the clamping block by approximately one-eighth of an inch.

To hold the alignment block in place after aligning the pages, some heavy weight or clamps may be used. The weight is placed on the rear portion of the block to reduce the tendency for it to shift position.

Each page is laid down one page at a time, with the smooth edges toward the alignment pins. The ragged stem extends beyond the edge of the clamping block, where it can be reached for trimming.

When all of the pages are neatly stacked onto the clamping block, a weight is placed temporarily on top of the pages to keep them from drifting in the breeze. A clamping bar is placed over the top of the stack so that the edge of the bar runs parallel with the edge of the clamping block.

"C-" or expandable wood clamps are then used to clamp and apply pressure to the paper stack. How tight must the clamps be? That's a tough question to answer, but the answer can be determined when rasping begins. If the pages tend to move, then the clamping pressure isn't high enough. Another gauge is that the tighter the stack, the easier the paper is to cut with the rasp. Too tight, though, will cause the clamping bar to bend and the pages to twist or shift under clamp pressure. Yes, a happy compromise is desired.

Part 1 of this series provided a listing of materials and tools needed for a ham to bind important technical documents. Here in Part 2, we have provided details of how publications are bound and the way they can be taken apart. Part 2 also provided the details for setting up the binding equipment in preparation for rasping and gluing the stem of the new volume. Part 3 will follow, and provide the steps involved in rasping and gluing the stem, followed by the making of a cover for the "new" annual volume. 73

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Read All About It!

Part 6 of good stuff from The Hertzian Herald.

All about The world of decibels; I am, therefore I ham; and Radio bug bites boy.

Great signal here, OM. You're peaking 20 dB over S9. This receiver has a 50 dB notch filter and it took that carrier right out.

Decibels (dB) are everywhere in ham radio, but how many hams understand them? The first point to grasp is that a decibel does not represent an amount, like a volt or a watt — it represents the ratio of two power levels.

Consider an amplifier that receives a 1 W input signal and delivers a 10 W output signal. It has a gain of 1 bel, or ten decibels, or 10 dB. (The original unit Bel, developed at the Bell Telephone Labs, was deemed too clumsy, so it was split into tenths.) The formula for getting from power ratio to gain (G) in decibels is G = 10log(P2/P1). In our example, G = 10log10 = 10 x 1 = 10 dB.

The logarithm (log) of a number is the power that you have to raise 10 to get that number. The log of 10 is 1; the log of 100 is 2; the log of 1000 is 3; and so on. Logs do not have to be whole numbers. For example, the log of 316 is 2.5. Literally, this means that we multiply 10 by itself (or 2 times), getting 100, and then by a half a time (square root of 10, or 3.16) getting 316. Extending this idea, we can (with a calculator) get a log for any number. For example, log 567 = 2.754.

Now we are in a position to see how decibels can be more useful than simple power ratios. Let's say we have two amplifiers in cascade. The first builds 1 W up to 10 W (a gain of 10 dB) and the second builds 10 W up to 100 W (also a factor of 10, or 10 dB). The overall power ratio is 10 x 10, or 100 times. However, the overall decibel gain is 10 dB + 10 dB, or 20 dB.

Decibel gains don't multiply; they add. Going back to our formula: G(tot) = 10log(100 W/1 W) = 10log100 = 10 x 2 = 20 dB. If this seems confusing, remember that a decibel is a log, and a log is a power of ten. And when you add another power of ten you multiply your result by ten.

Perhaps the example of two x10 amps is too simple to make the point. Let's consider a first amp with a power gain of x39 (which is 16 dB), feeding a second amp with a power gain of 6.3 (which is 8 dB). Using power ratios, the overall gain is: A(tot) = A1 x A2 = 39 x 6.3 = (can you do that in your head?).

But in decibels, it's easy to do in your head: G(tot) = G1 + G2 = 16 + 8 = 24 dB.

As another example, let's say that we have an amplifier with a power gain of x39 feeding a transmission line with a loss factor of "divide by 6.3." "Divide by" in power factors is represented by negative decibels, so the overall gain is: G(tot) = G1 - G2 = 16 - 8 = 8 dB.

When an entire communications system operates in the dB system,

dB	V/V
3	1.41
6	2
10	3.16
20	10
30	31.6
40	100
50	316
60	1000

Table 1.

Reprinted with permission from *The Hertzian Herald,* newsletter of the Monroe County (MI) Radio Communications Association (MCRCA).

keeping track of the signal level at any given point is a simple matter of adding and subtracting decibels. Like the English-vs.-metric conflict, the conversions are the hassle. If you just stay in the more efficient system (metric or decibel) your measurement and calculation burden is greatly eased.

Here's a practical tip: Nobody writes mA = 32. That's obviously improper. You should write I = 32 mA. Similarly, you should not write dB = 32 (although many people do). The proper way is to write G = 32 dB.

Once again, the formula for gain (G) in decibels is: G = 10log(P2/P1)

If the gain is actually a loss, and P2 is smaller than P1, the value of G becomes negative. (Try it on your calculator — a power gain from 1 W to 2 W is 3 dB; a loss from 2 W to 1 W is -3 dB.)

Voltage is much easier to measure than power, so we would like to be able to determine dB from voltage measurements. This is possible IF the two voltages, V1 and V2, are measured across equal resistances. Since power varies as the square of voltage, and doubling a log squares the number, the voltage-ratio-to-dB formula is: G = 20log(V2/V1).

We must emphasize that this equation is valid ONLY if V2 and V1 are measured across equal resistances.

People who work with decibels a lot soon commit **Table 1** to memory. Using the table, you can quickly see that 26 dB is 20 dB + 6 dB, which is a voltage ratio of 10 x 2, or 20 times. As another example, 37 dB is 40 dB - 3 dB, a voltage ratio of 100/2 = 50 times.

Notice that decibels are nonlinear: 40 dB is not twice the voltage ratio, nor twice the power ratio, as 20 dB.

OK, so we can convert power ratios, or voltage ratios, to decibels. How do we go the other way: dB to gain factors? Here are the formulas: P2/P1 = inv-log(dB/10) and V2/V1 = inv-log(dB/20). The inverse-log key on your calculator may be labeled log -1, or 10-to-the-x power.

We have said repeatedly that decibels specify a ratio, not an amount — but engineers often do specify a signal level in dB. This is possible because they are assuming a standard level for P1 or V1. In the audio industry, the standard (0 dB) level is 1 mW. Thus a 2 mW signal is 3 dB, and a 10 mW signal is 10 dB. In cable TV, the standard is 1000 μV on 75 ohms, so a 500 μV signal is -6 dB.

Finally, let's try to put decibels into an everyday context. The threshold of audibility for humans under ideal conditions is the 0 dB reference level. A whisper is 15 dB; average conversation is 55 dB, and 85 dB is a jackhammer. A 1 dB change is just about the smallest perceptible change. A 10 dB change is what most listeners would judge to be "twice as loud," although, of course, it is actually

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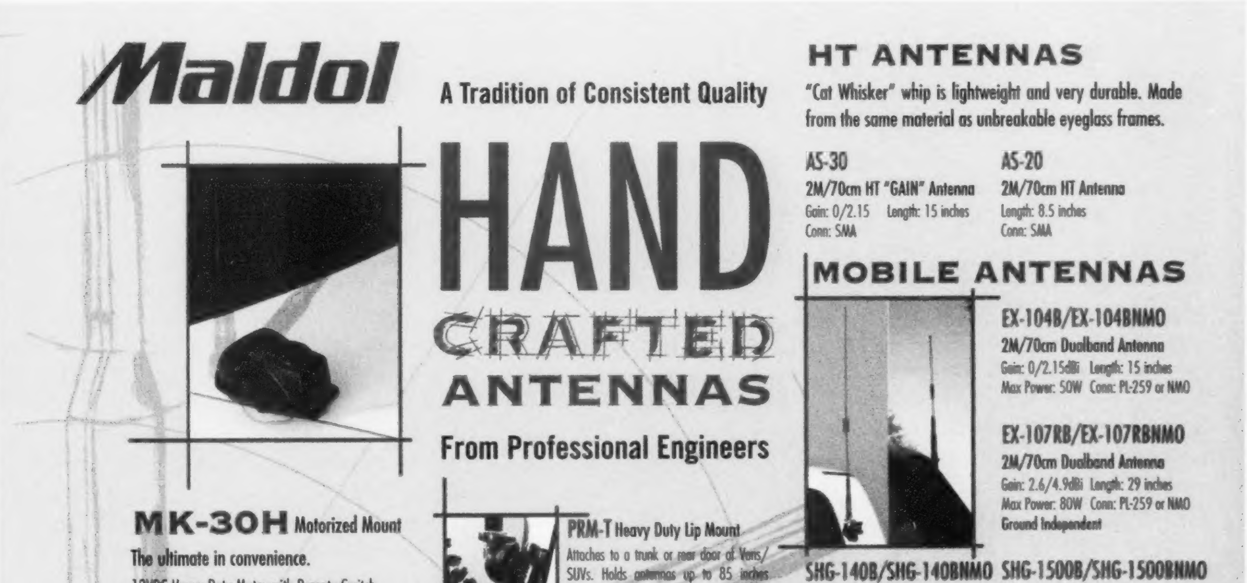
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ten times the power, or 3.16 times the voltage.

I am, therefore I ham

"Hi, Art. How's it going?"

"Oh, not bad. How are you?"

"Can't complain. Hot enough for you?"

"Is it! I'm ready for fall."

"Me, too. Well, take it easy."

"OK. See you later."

I have conversations of this same innocent type half a dozen times a day, at least, with neighbors or colleagues at work. It's a pretty pointless conversation from an objective standpoint, yet the cumulative effect of these exchanges is to make us feel that we "belong" in our neighborhood or work community. How would you feel, for example, if you met a neighbor on the sidewalk and he refused to exchange these few meaningless words with you?

Then why is it that hams are constantly berating themselves about how the QSOs on 2 meter FM, or 75 phone, or 40 CW are repetitious, mechanical, and boring? We don't expect scintillating discourses on social improvement or astrophysics from our neighbors. Why do we expect it of hams we meet casually on the air?

Perhaps the bar was raised in the '30s and '40s when some rather special conditions prevailed in ham radio. Nearly all hams built their own gear then, and the technical experience landed many of them good jobs in radio and TV. Ham radio often provided the only means of communications in an emergency. And trans-oceanic QSOs were the stuff of magic in the days before satellites. By contrast, today's "rice boxes" provide little in the way of technical training, ordinary QSOs pale beside the remembered SOS calls of yesteryear, and any Joe on the street can punch up a call to Europe on his cell phone.

Columbus, Magellan, and Cook made their courageous voyages of discovery in sailing vessels because that was the technology of the time. New technology has made sailing obsolete, commercially; but thousands of enthusiasts still ply the waters of Lake Erie in sailboats — just because they love sailing. And they make no apologies because they may not be advancing the science of transportation, may not be carrying any useful cargo, and may not even be going anywhere.

Ham radio is a hobby. We do it because we love it. It is as worthy a hobby as sailing or golf or guitar playing. And it is as worthy a use of spectrum space as most of what occupies the AM, TV, and shortwave broadcast bands. We have no apologies to make because it is no longer the life-saving, cutting-edge hobby that it was in 1936.

Hams often talk doomsday because so few young people are coming into the hobby. It is true that in 1958, when I got into it, half the hams on the air were kids. Today, the teenagers mostly gravitate to computers rather than ham radio. This is as it should be — they're going to be looking for jobs, and they know where those jobs are. But still, I talk to many, many new hams. Typically, they're in their late 40s. Their kids are grown, and now it's time to take up a hobby.

We need to loosen up and simply enjoy this great hobby of ours. It's doing just fine, and will probably outlive most of us.

Radio bug bites boy

The most anticipated present that Christmas of my eighth-grade year was a Red Ryder BB gun, but in a small box (left toward the end, as probably containing only clothes) was a one-transistor AM radio kit — really little more than a crystal set as I look back on it. In the snow and slush I strung the fifty feet of aerial wire from my bedroom window to the old pear tree, and fell asleep many a January night listening to WSPD, WJR, and CKLW — usually simultaneously. It was 1957, but I wasn't interested in Buddy Holley or Elvis Presley — I was absolutely fascinated by the feat of pulling voices out of the air from fifty miles away. It was magic.

Of course, I had grown up listening to The Lone Ranger and Sergeant Preston of the Northwest Mounties on the superhet in the living room; by 1954, that set had been replaced by a 17-inch black-and-white RCA television, but these were just appliances — pieces of furniture — whose innards were no more to be comprehended than those of the bus that took me to school. My little radio had only five or six parts. Maybe I could find out how it worked.

By spring, I had read every "Boy's Book of Radio" in the library, but my experiments had led to the demise of my one-transistor radio. Efforts to build my own radio from plans in the "Boy's Books" were proving unsuccessful. I remember stripping yards and yards of vinyl-insulated wire left behind when a phone-company truck drove away; somehow I had become convinced that a tuning coil had to be wound with bare wire.

Finally, in desperation, I cracked open my piggy bank and plunked down all eighteen dollars for a Philmore two-tube-plus-rectifier regenerative radio kit, with AM plus 6 to 18 Mc shortwave band (whatever that meant). The Allied Radio Ocean Hopper and the famous Heathkit AR-3 were available at that time, but we had never heard of them or seen their catalogs — and the wiley old coot at the radio store was not about to enlighten us. My father and I built that radio on a card table in the kitchen, heating the non-electric soldering iron on the burners of the stove. The directions were mimeographed and sketchy, so I marvel still to think that we got it working first time. I still have the schematic: 12SJ7 regen-detector, 50L6 audio amp, 35Z5 rectifier. Pretty standard layout.

I spent the first week or so listening to the BBC, the Voice of America, and Radio Moscow. Pretty heady stuff, in the days before long-distance telephone calls were common, to hear the commies talking to you direct. But before long, I discovered the ham bands. SSB was just getting started in '57, so there were lots of AM stations to be heard. I started picking up the jargon: QTH, RST, CQ, OM, QRM. It slowly dawned on me that I could become a transmitting "ham" and that it required knowledge of the Morse code. I made flash cards (quite useless) in an effort to learn it.

In September I started high school, and the school had a radio club. At last, I had some upperclassmen I could talk radio with — and who would send me code practice. By mid-November of '57, I was picking up snatches of CW from the 40-meter Novice band on that clumsy regenerator. (I still have the SWL log I kept of all my eavesdropping.) Christmas of 1957 was quite a harvest: a Hallicrafters S-38E receiver (4 tubes plus rectifier), an Eico 1000-ohm-per-volt multimeter, and an electric soldering gun. My listening-in took a strong turn away from AM and towards CW as I prepared for my Novice test.

The Rev. Alfred Schindler, pastor of St. Catherine's Church, gave me that test on Feb. 15, 1958. I had attended his church and school for years, but had no idea that he was W8OXK. To me, he was the venerable and somewhat distant prelate who officiated up at the altar. I was rather astonished when, instead of giving me the regulation five minutes of text at a measured 5 wpm, he just tapped out eight or ten letters, saw that I was copying it, and announced that I had passed.

In the two months it took the FCC to process my license, Dad and I built a Heathkit DX-20 transmitter and strung a 40-meter dipole from the house to the garage. Shortly before the big day, Dad discovered that Joe W8LNV lived just two blocks down the street, and he agreed to be my first QSO.

On April 16 the ticket arrived — I was KN8JWR. I called Joe to arrange a QSO, but I hadn't the slightest idea what to say, and my fist was shaking so violently, I'm sure my CW was unintelligible. The big problem was finding my frequency on the receiver. Every time I touched the key, even with both antennas off, there was this big BLATT that blanked out the whole Novice band.

Eventually, I read Joe sending congratulations and telling me to get off on my own and make a QSO. So, with my hand still trembling, I sent: CQ CQ CQ de KN8JWR, took the receiver off standby, and listened.

The word "crowded" does not even begin to describe the condition of the 40-meter novice band in 1958, when I got my license. The only thing that approaches it today is Field Day or Sweepstakes — but, of course, the CW was slower. I did a little survey of my Novice-days' QSLs: two thirds of us were using receivers without crystal filters. The bandwidth was about 6 kHz, so we usually heard at least six stations at once. A common challenge was to set the dial at random and see who could copy three different stations without touching the dial — just by concentration.

In 1958, about 70% of us were using transmitters built from kits, 20% had home-brews, and 10% had commercially built rigs. If you could copy a signal report, a name, and a state before the QRM clobbered the guy, it was a good QSO. Postcards were 2 cents (until August, when they went to 3 cents), and if you could get a city and an address through so you could exchange QSLs, it was a cause for celebration. If you couldn't get it through, you had to wait until your call appeared in the next year's *Callbook* to get your QSL; no Internet callsign servers then.

Well, I put out CQs for about ten minutes that first night, and was lucky enough to copy KN9JSK coming back. It took ten minutes to get his state and a signal report (489) through the QRM — then he was buried in it. (I still have the QSL from that first contact — it's displayed in the top left slot on my bulletin board.) I called a few stations and sent a few more CQs, but heard no more replies. Then it was ten o'clock and QRT — school night, you know.

The next day, I got on right after school and found the band somewhat less crowded. I had a 50-minute ragchew with Wisconsin, and then worked North Carolina. In a month I had worked 14 states, as far out as Texas. During the next summer break, I once got up at 4:30 a.m. to get away from the QRM, and worked Oregon — the West Coast at last!

How can someone of today's generation understand what direct communication over such distances meant to a 14-year-old in 1958? I had never been outside the states of Ohio and Michigan. This was way before cell phones and the Internet. It was before direct-distance dialing and satellite relay — Sputnik had gone up less than a year before. I remember Dad with his hand over the mouthpiece of the phone saying, "It's long distance," and Mom replying as a matter of course, "Who died?" In those days long-distance calls were for emergencies only.

That autumn I got my General ticket and began knocking off states toward my WAS on 20 meters. (I remember my civics teacher's astonishment when I filled in a map with the name of every state in about five minutes: It was a snap — I had worked most of them.) Soon after, I started working a little DX on 15 meters. Any DX was rare then, and pileups for the DX stations were awesome. It was only 13 years after the devastation of WW II in Europe, and I suppose those folks were still struggling for basic necessities, with little time or money left over for hobbies.

In January, I hooked up the output of an old two-watt phonograph amplifier to the screen-grid of the 6DQ6 final of my DX-20 transmitter and went AM with 32 watts input. (Transmitters were never rated by RF output then.) I had run into a number of local teenage hams by then, and we began congregating on 75-meter phone every day after school — the Teen Net of Toledo, we called it. We formed our own teenage radio club, with perhaps 30 members. Meetings rotated around to members' shacks, and we put on some spectacular Field Day performances.

I'd say it was ham heaven, although I didn't realize it at the time, and I'd give anything to be 15 again, climbing a tree to secure the end of a Field Day antenna at Side Cut Park.

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By Eric Shalkhausser W9CI, SK

The History of Ham Radio

Part 5: The first convention.

The first amateur radio get-together of any size was the St. Louis Midwest Convention in December of 1920, shortly after our licenses became available in 1919. No sooner had the enthusiasm at the St. Louis gathering died down than the ARRL Board of Directors proposed a national convention.

In these early years after World War I, there was so much newness in everything connected with wireless, and there were so many original and worthwhile ideas to be aired, that no mere Morse code contact was sufficient. Voice communication had not as yet entered our amateur wireless channels. Amateurs were on the verge of many new developments. Major Armstrong had announced his "single" signal regenerative and then his superregenerative receiver designs. There were new circuits to be tested in the transmitter field, including the Colpitts, the Meissner, the Hartley, and the Heising, among others.

Amateurs wanted to be informed. They found themselves in new technical surroundings. So, for the first time, citizens of the United States and Canada, all interested in privately owned and operated radio communication, decided to come together from far and near to a big first national convention.

Reprinted from *73 Amateur Radio,* December 1977, where this was originally reprinted from *QCC News,* a publication of the Chicago Area Chapter of the QCWA.

The first gathering of the clan took place from August 30 to September 3, 1921, at the Edgewater Beach Hotel, located on the shore of Lake Michigan in Illinois. History relates that, following the success achieved at this first national convention, it was ordained that two succeeding ARRL national conventions were also to be held at the Edgewater Beach Hotel in Chicago at two-year intervals — September 11 to 15, 1923, and August 18 to 23, 1925.

There was no telling what impact these get-togethers would have on the future destiny of amateur radio. Great effort and meticulous preparations were made for months in advance to ensure success. Everyone connected with the preparations hoped that this first national meeting would find attendance coming from the far reaches of the States and Dominions, representing all districts.

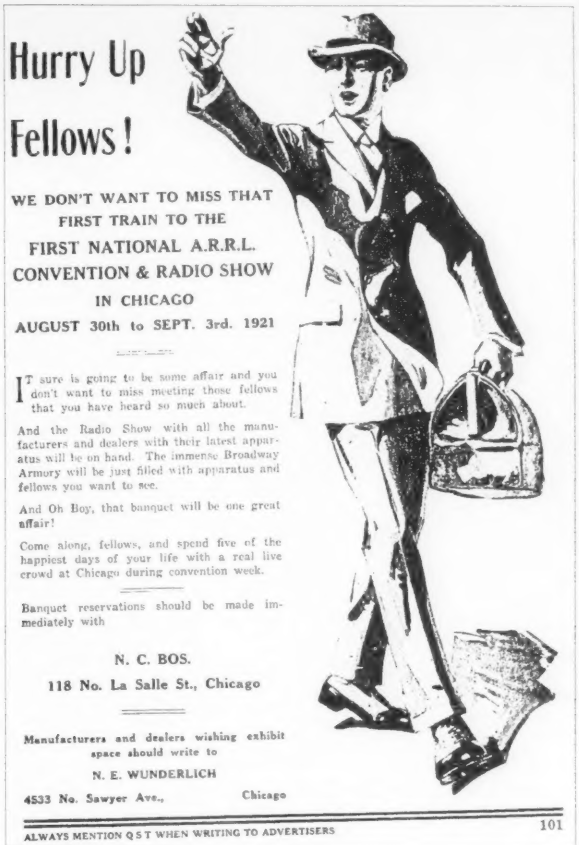
The midwest location proved to be a most strategic and advantageous choice. The Edgewater Beach Hotel was at the far north edge of Chicago, away from heavy traffic, with R.H.G. Mathews' 9ZN station located just to the north on the lake shore, sporting two tall station towers, a multiwire antenna, and up-to-date equipment in his spacious shack. All agreed that this was an ideal spot to congregate.

The convention committee had booked a large arena, the Chicago Broadway Armory, located within walking distance of the hotel. About fifty manufacturers and dealers in ham radio gear of all descriptions displayed and demonstrated their products. For the first time, amateurs had an opportunity to talk shop with those people who had kept amateur radio alive through their advertising in *QST, Radio Amateur News, Wireless Age,* catalogs, and other literature. This was a ham's paradise!

The convention hall, where all the sessions took place, was a beehive of activity. There was no let-up in making personal contacts, exchanging QSLs, and discussing many subjects slated on the agenda.

The first day

The ARRL president, Hiram Percy Maxim, addressed the members with an inspiring talk concerning the aims and accomplishments that amateur radio had achieved in the relatively few years of the ARRL's organization. In



Hurry Up Fellows!

WE DON'T WANT TO MISS THAT FIRST TRAIN TO THE FIRST NATIONAL A.R.R.L. CONVENTION & RADIO SHOW IN CHICAGO AUGUST 30th to SEPT. 3rd. 1921

IT sure is going to be some affair and you don't want to miss meeting those fellows that you have heard so much about.

And the Radio Show with all the manufacturers and dealers with their latest apparatus will be on hand. The immense Broadway Armory will be just filled with apparatus and fellows you want to see.

And Oh Boy, that banquet will be one great affair!

Come along, fellows, and spend five of the happiest days of your life with a real live crowd at Chicago during convention week.

Banquet reservations should be made immediately with

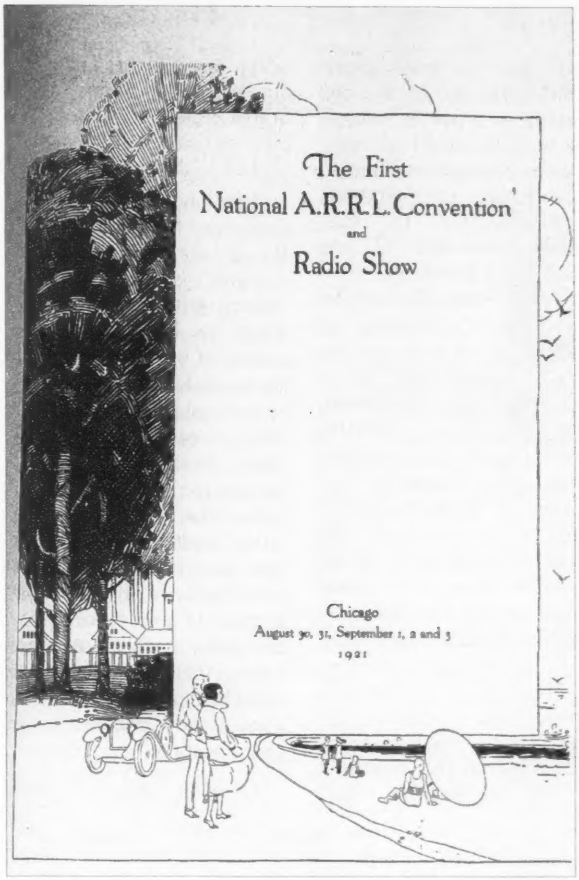
N. C. BOS.
118 No. La Salle St., Chicago

Manufacturers and dealers wishing exhibit space should write to

N. E. WUNDERLICH
4533 No. Sawyer Ave., Chicago

ALWAYS MENTION Q S T WHEN WRITING TO ADVERTISERS 101

***Photo A.** Advertisement for the First National ARRL Convention & Radio Show in Chicago, August 30th to Sept. 3rd, 1921.*



The First
National A.R.R.L. Convention
and
Radio Show

Chicago
August 30, 31, September 1, 2 and 3
1921

***Photo B.** Convention announcement opening sheet.*

his introductory remarks, the founder of the League had the following to say:

"As we meet and open this great convention, it is indeed a historic event. … In years to come, much will be said about what we do here at this first convention. We are striking out into the unknown, and even the smaller actions which we take here during the next few days will weigh heavily in the future, for they will establish precedents and standards. … Let us not forget that we are pioneers, blazing a way many are to follow. Our responsibility is great, and we must so regard it. It is one thing to repeat what has already been done, but it is another altogether different thing to do what has never been done before. What you see before you here today has never happened in the affairs of man. Not only is it a great pioneer effort in radio history, but it is a great pioneer effort in political history. We American and Canadian citizens assembled in this room represent pioneers in the development of something totally revolutionary in the art of communication. The like of what we are doing and proposing had never crossed the brain of man a short ten years ago. We already have a privately owned, absolutely free, continent-wide means of instantaneous communication, and no man may say we shall not make it worldwide." (What prophetic statements emerged from this gathering of dedicated and enthusiastic men!)

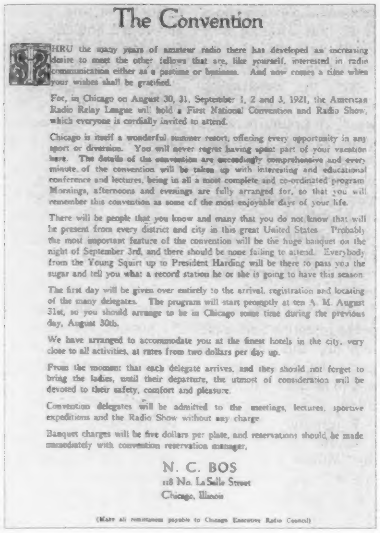
"It is no small distinction," our president went on to say, "to be one of those who make history."

General and technical sessions

There would be no point in listing the names of the high and low notables in attendance. They were all present. The program committee had topics scheduled for discussion pertaining to club organization, interference control, observations of laws, legislative matters, message handling, and many technical subjects.

Charles H. Steward, member of the ARRL legislative committee, reviewed pending legislation, a matter which required constant attention. Seven bills under debate in Congress at that particular time related to subjects concerning radio control, radio regulation, and enforcement. Observations made at this meeting were that: "If just two of these bills go through in their present form, the wavelengths, power, and decrement are then subject to control of the Commission, and they keep us champing around from one wavelength to another, increasing and decreasing the power available for amateurs. Constant vigilance is of vital importance to ensure the amateur's place in the radio spectrum."

Probably the topic that drew top attention during the convention, and that was subject to heightened debate,



The Convention

THRU the many years of amateur radio there has developed an increasing desire to meet the other fellows that are, like yourself, interested in radio communication either as a pastime or business. And now comes a time when your wishes shall be gratified.

For, in Chicago on August 30, 31, September 1, 2 and 3, 1921, the American Radio Relay League will hold a First National Convention and Radio Show, which everyone is cordially invited to attend.

Chicago is itself a wonderful summer resort, offering every opportunity in any sport or diversion. You will never regret having spent part of your vacation here. The details of the convention are exceedingly comprehensive and every minute of the convention will be taken up with interesting and educational conference and lectures, being in all a most complete and co-ordinated program. Mornings, afternoons and evenings are fully arranged for, so that you will remember this convention as some of the most enjoyable days of your life.

There will be people that you know and many that you do not know that will be present from every district and city in this great United States. Probably the most important feature of the convention will be the huge banquet on the night of September 3rd, and there should be none failing to attend. Everybody from the Young Squirt up to President Harding will be there to pass you the sugar and tell you what a record station he or she is going to have this season.

The first day will be given over entirely to the arrival, registration and locating of the many delegates. The program will start promptly at ten A. M. August 31st, so you should arrange to be in Chicago some time during the previous day, August 30th.

We have arranged to accommodate you at the finest hotels in the city, very close to all activities, at rates from two dollars per day up.

From the moment that each delegate arrives, and they should not forget to bring the ladies, until their departure, the utmost of consideration will be devoted to their safety, comfort and pleasure.

Convention delegates will be admitted to the meetings, lectures, sportive expeditions and the Radio Show without any charge.

Banquet charges will be five dollars per plate, and reservations should be made immediately with convention reservation manager,

N. C. BOS
118 No. LaSalle Street
Chicago, Illinois

(Make all remittances payable to Chicago Executive Radio Council)

***Photo C.** Announcement for the first Convention, 1921.*

proved to be the controversial question of power factor in ham transmitter circuits. As one reporter remarked afterward, "Without a doubt, this debate was the main attraction at the convention."

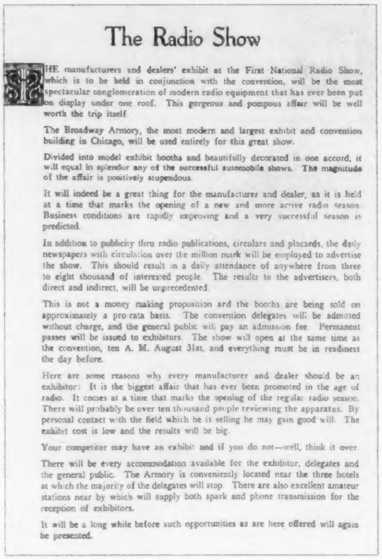
There were staunch supporters of the two main participants in the discussion, and it did not take long before sides were chosen. At the outset, Ellery W. Stone from the west and W.B. West 8AEZ were the antagonists in this struggle for definition and thoroughness of detail for presentation of facts.

Said Mr. Stone: "Power factor is unity in any AC circuit in which inductive and capacitance reactances cancel."

Said Mr. West (ignoring inductance and capacitance): "I confine my views in the matter to the relation of real watts to apparent watts."

This confrontation went on for hours, with other participants joining, until all agreed that it appeared that the confusion lay in the definition of power factor. There was no common understanding reached by the two parties. So it was decided, on the spot, to submit the question to the radio section of the Bureau of Standards, Washington, DC. The statement submitted to the Bureau read as follows:

"For information of National Convention of ARRL, please wire our expense immediately: In a freely oscillating radio circuit, and in a forced oscillating circuit tuned to resonance with the impressed frequency, if the inductive and capacitive reactances are equal in magnitude and opposite in sense, is the power factor unity? One side contends that, according to present alternating current theory, the power factor is unity, and reactances are equal and opposite. Other side contends that resonance is that condition in circuit which causes power factor to automatically assume that degree necessary for the complete dissipation of the power applied to the circuit."



The Radio Show

THE manufacturers and dealers' exhibit at the First National Radio Show, which is to be held in conjunction with the convention, will be the most spectacular conglomeration of modern radio equipment that has ever been put on display under one roof. This gorgeous and pompous affair will be well worth the trip itself.

The Broadway Armory, the most modern and largest exhibit and convention building in Chicago, will be used entirely for this great show.

Divided into model exhibit booths and beautifully decorated in one accord, it will equal in splendor any of the successful automobile shows. The magnitude of the affair is positively stupendous.

It will indeed be a great thing for the manufacturer and dealer, as it is held at a time that marks the opening of a new and more active radio season. Business conditions are rapidly improving and a very successful season is predicted.

In addition to publicity thru radio publications, circulars and placards, the daily newspapers with circulation over the million mark will be employed to advertise the show. This should result in a daily attendance of anywhere from three to eight thousand of interested people. The results to the advertisers, both direct and indirect, will be unprecedented.

This is not a money making proposition and the booths are being sold on approximately a pro rata basis. The convention delegates will be admitted without charge, and the general public will pay an admission fee. Permanent passes will be issued to exhibitors. The show will open at the same time as the convention, ten A. M. August 31st, and everything must be in readiness the day before.

Here are some reasons why every manufacturer and dealer should be an exhibitor: It is the biggest affair that has ever been promoted in the age of radio. It comes at a time that marks the opening of the regular radio season. There will probably be over ten thousand people reviewing the apparatus. By personal contact with the field which he is selling he may gain good will. The exhibit cost is low and the results will be big.

Your competitor may have an exhibit and if you do not—well, think it over.

There will be every accommodation available for the exhibitor, delegates and the general public. The Armory is conveniently located near the three hotels at which the majority of the delegates will stop. There are also excellent amateur stations near by which will supply both spark and phone transmission for the reception of exhibitors.

It will be a long while before such opportunities as are here offered will again be presented.

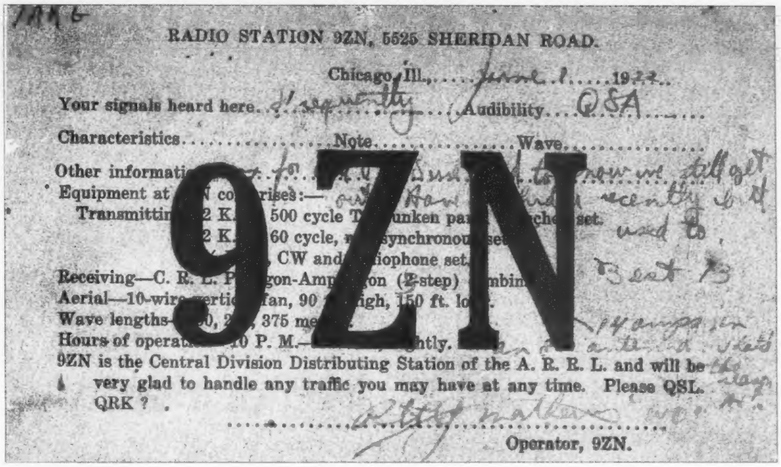
***Photo D.** Radio show announcement.*

QST
AMATEUR RADIO STATIONS
RADIO 9ZN

***Photo E.** Radio 9ZN description from* QST.

Within hours after the telegram was forwarded to the Bureau, the reply came back … with an answer that, in essence, left both sides very much up in the air. Supporters of both Mr. West and Mr. Stone hailed the outcome of the reply as complete vindication of their respective sides. Even a committee thereupon appointed to review the entire discussion finally ended up by stating that they were not reasoning from the same premise. Most of those in attendance finally concluded by these vague decisions that another subject could be more productive and down to earth and headed for other meetings.

Of great interest to amateurs who were still purchasing and installing spark gap transmitters was the subject of broadband interference. It was contended that spark gap units were doomed to fade out of ham stations, because the waves they transmitted on the air were not as sharp as a CW wave. It is true that they could be held better in reception and did not have tendencies to jam each other, like the CW signals did. Also, each spark on the band had an individual characteristic that identified it, and what distances could be covered (having 1000



RADIO STATION 9ZN, 5525 SHERIDAN ROAD.

Chicago, Ill., June 1 1922

Your signals heard here [illegible] Audibility QSA

Characteristics Note Wave

Other informati[illegible] now we still get [illegible] recently [illegible] used to

Equipment at [illegible] co[illegible]rises:—

Transmittin[illegible] 2 K. [illegible] 500 cycle T[illegible]unken pa[illegible]che[illegible] set.

2 K. [illegible] 60 cycle, [illegible]synchronou[illegible] se[illegible]

[illegible] CW and [illegible]iophone set.

Receiving—C. R. L. P[illegible]gon-Amp[illegible]on (2-step) [illegible]mbin[illegible]

Aerial—10-wir[illegible] verti[illegible] fan, 90 [illegible] high, 150 ft. lo[illegible]

Wave lengths[illegible]0, 2[illegible], 375 me[illegible]

Hours of operat[illegible] 10 P. M.—[illegible]ghtly.

9ZN is the Central Division Distributing Station of the A. R. R. L. and will be very glad to handle any traffic you may have at any time. Please QSL. QRK ?

Best 73

14 amps [illegible]

Operator, 9ZN.

Photo F. *9ZN QSL card, June 1922.*

Watts available)! The overall sensitivity and selectivity of circuits was a hindrance. The CW signals were difficult to tune and hold. Wave shifting was usually noticeable. Regenerative receivers had shortcomings, especially since they were asked to be equally effective in bringing in CW, ICW, and the broad spark signals. Receivers lacked adequate control to meet requirements. Being regenerative, they radiated energy and caused considerable interference, especially in more congested areas.

For most signal reception, the oversized loose couplers in station equipment were still serving their major purpose. Domestic and foreign long-wave stations were very much on the air with news broadcasts, weather reports, time signals, and general information. Many stations served as sources of code signals for practice — NAA, 2,500 meters; POZ, 12,000 meters; PL, 10,000 meters; and MUU, 14,000 meters, continued on the air for years.

So loose couplers were in constant use by amateurs until, with the introduction of the honeycomb-coil design, units that occupied far less space but had equivalent inductance gradually replaced them. Amateurs also began to convert to shorter and shorter wavelengths with the move to CW and the application of available transmitting tubes. Amateur station layouts began to take on new and revitalized appearances. Power supplies had to be designed and built to accommodate larger tubes for that new requirement of "juice" for the "bottles." In turn, many new receivers were being built using variometers and variocouplers.

As is the case each year, with the coming of fall and colder weather, radio conditions improved, static tapered off, and interest in DX and relay activities increased. So the ARRL Board of Directors decided that a determined effort should be made to span the Atlantic via amateur radio. There had been an earlier try, not organized, that had failed. Undaunted, plans were laid by the ARRL traffic department announcing that all radio amateurs should enter into a series of transmitter tests. Selections would be made to find the best and most far-reaching transmitters to qualify for the proposed undertaking. The following form appeared in *QST*, September 1921, page 12, directed to all hams:

"Traffic Manager, ARRL, 1045 Main Street, Hartford CT: Please enter my station as a transmitter in the Transatlantic Sending Tests, Dec. 8th to 17th. I will be ready to transmit in the preliminary tests on Nov. 7th to 12th, and if I fail to cover the specified distance in the preliminary tests, I shall relinquish my rights to transmit in the final tests. Name … Call … St … City … State … Power of transmitter … type (CW or spark) … greatest distance heard (give three records) …"

The stated goal was: "We want the Atlantic Ocean spanned on schedule by an amateur station, and we want definite proof that it has been done."

To be continued.

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  - General Class **(Element 3)** $12.95
  - Extra Class **(Element 4)** $14.95
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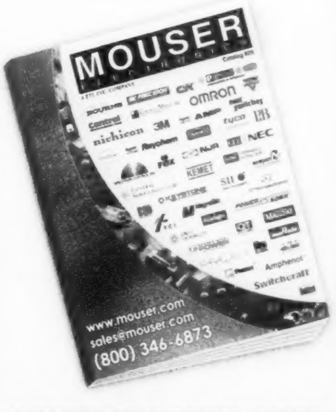

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More New Stuff

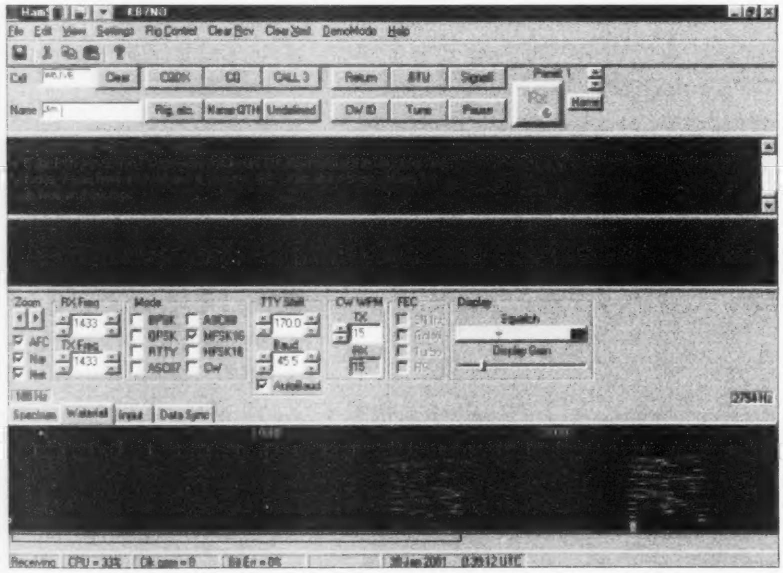
Once again, there is more new stuff out there in digital land. Some of you are helping me find it and get me going. Way to go, guys!

Also, I have received some on-the-air info to help clear up gaps in my gray cells (between the ears). I have enough material before I start this month's column that I am having to pick and choose. Some of this may be just what you are looking for!

To begin, this is the first of the year as I write this, so some of this may be old-hat by the time you get it. However, I will start with a new program that appears in what we might term "standard screen format" for MFSK16. (See **Fig. 1.**) This is HamScope, written by Glen KD5HIO, and it does a lot more than simply put a new slant on this brand new mode recently popularized with the Stream software from Nino IZ8BLY.

The very first impression I had of this program once I got it up and running was that it does about everything, especially considering it is the first release, version 1.21. For starters, I should digress for a few lines and applaud the efforts of the author. When I first installed the program and went to setup, it locked up.

I contacted Glen with a description of what was happening. He was right on top of the problem and explained a process the program went through during the initial setup process. Then he sent a modified version, which is the one currently available for download, and the program has worked the way you would expect ever since.



RX Freq 1433
TX Freq 1433
Mode ☑ MFSK16
TTY Shift 170.0
Baud 45.5
CW WPM TX 15 RX 15

Fig. 1. HamScope screenshot. This is a live shot with two MFSK16 sigs in the waterfall. To tune to the sig on the right, you would simply click on the bright "leg" at the bottom, much as with the Stream software. Included are optional tuning displays other than the waterfall. The receive and transmit panes are resizable. The macros are easily edited and there are more macros just a click away. There are eight selectable modes and a lot of little niceties you will discover as you play with it. It is intuitive. The setup is quick and, as with many of the new programs, you can be on the air in minutes after installation.

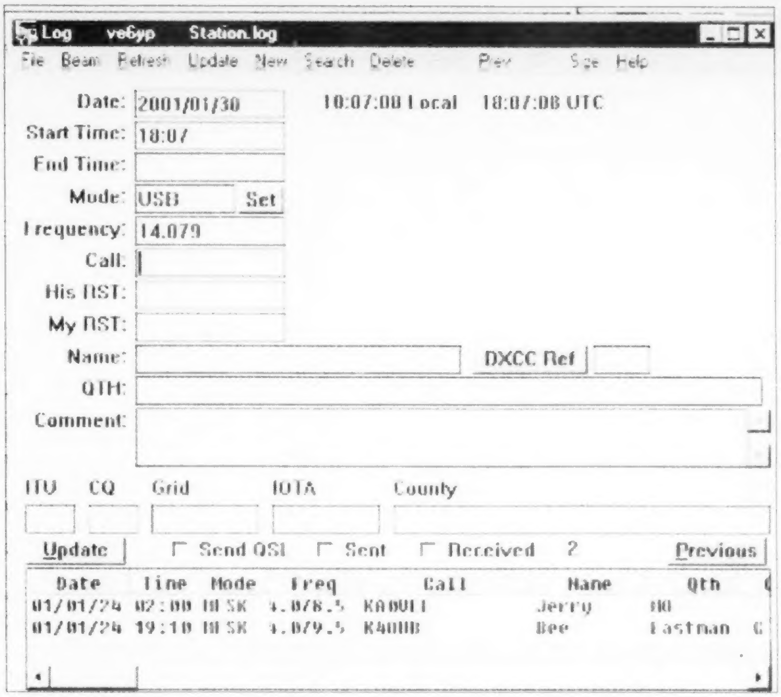
At this writing, there are a few rough spots that are noticeable but, hopefully, by the time this print hits your mailbox, those will be ironed out as well. The program is multimode in that it not only does MFSK16, but also PSK31, CW, RTTY, and a unique version of MFSK16 that includes forward error correction (FEC) and is dubbed HFSK16.

The rough spots thus far center on less-than-best RTTY and complaints about the CW decoding. With all due respect to the complainants, even with these shortcomings, the program as a whole is a work of art. The two modes I have used the most are PSK31 and MFSK16, and the performance in these modes is outstanding.

I have made numerous contacts during the past few weeks and have met a number of other users. The acceptance of the format and the ease of tuning the MFSK16 is often echoed. I even gave the optional spectral display a go for tuning and found that display, with a little practice, to be practical for accurate tuning.

The macros are easily edited. This is a priority for me. I like to type ahead, which is supported easily, and with the inclusion of judiciously written macros, my end of the QSO looks a lot like it was written by a proficient typist. A lot of hams have difficulty with typing (more so than I), and if they could see how easy it is to use macros and type ahead while the other station is transmitting, they would be put at ease and attempt these keyboard modes.

To digress a minute, most of us get a little nervous when someone is watching over our shoulder as we type. I find I am just as susceptible to those jitters when my macros and typing crutches have run out and the ham at the other end can observe how I miss keys and have to make corrections. The errors increase exponentially all of a sudden. So, what I am saying is, "Take heart, you are not alone."



Date: 2001/01/30 10:07:08 Local 18:07:08 UTC

Start Time: 18:07

End Time:

Mode: USB

Frequency: 14.079

Call:

His RST:

My RST:

Name:

QTH:

Comment:

ITU CQ Grid IOTA County

```
  Date     Time  Mode   Freq          Call              Name      Qth
01/01/24 02:00 BPSK  4.078.5  KA0ULL               Jerry     MO
01/01/24 19:10 BPSK  4.079.5  K4OUB                Bee       Eastman  G
```

Fig. 2. YPLog screenshot. This is one of several screens available from this piece of shareware. This is an unregistered copy. Logging and radio interface are certainly not crippled. The panel is displaying the radio frequency and mode automatically along with the date and time and a few contacts I made while trying the software. Simple to operate, can be resized to fit with other programs on the monitor, and includes the regular search and printing features.

YPLog

I realized very early that one of the features I would miss most in using the HamScope rather than the Stream software was the logging interface. As many of you are aware, if you have Logger up and running when you click the "Log" button in Stream, the data is exported directly to Logger.

HamScope is compatible with the YPLog program, so I downloaded that and made a great discovery. YPLog is an outstanding piece of shareware. You can use the program from the free download for logging purposes without registering it for the going rate of $50. That makes the program attractive in itself.

I was not able to automate the program very well because I have a conflict of usage of my lone serial port. But I found that the program, operating on its own, interfaces perfectly with the Icom rig. It recognizes and displays frequency and mode and can control these functions and consequently record the information in the log along with the worked station data. (See **Fig. 2**.)

The program is intuitive. It requires very little reference to the in-depth Help file. If you are using the radio interface, the frequency and mode are automatically inserted. Of course, the date and time are automatic as expected. The layout is simple and direct, and users tell me good things about the software.

For my usage, with a small screen area, I display one screen at a time, and pull them up from the Task bar as needed. The ideal is to have the largest monitor the budget will allow and place your various screen displays on the monitor simultaneously. I experimented and found that the YPLog logging screen will resize as you desire for ease of fit. There are at least two other smaller screens you can display with more info from the program should you have the room. (See **Table 1** for download.)

The reason I need an additional serial port is for the PTT to operate with the digital communications programs. This addition is well worth considering for whatever the future of my digital software endeavors. It is possible to get a lot of good service from this old computer, but there seems to be frequent need for upgrade. Unfortunately, I don't see a way to upgrade by purchasing a

Continued on page 42

ICOM IC-756 PRO

The impressive **IC-756 Pro** covers HF plus 6 meters. The high resolution 5 inch TFT color display provides more operating information than ever, including a spectrum scope. The 32 bit floating point DSP provides crisp, clear reception with 41 built-in filters. The "Pro" is *the* choice for serious DXers and contesters.

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Source for:	Web address (URL):
Mix W Soundcard program for PSK31, RTTY, new modes, MTTY, FSK31, more	http://tav.kiev.ua/~nick/my_ham_soft.htm http://users.nais.com/~jaffejim/mixwpage.htm
MMTTY RTTY soundcard freeware	http://www.geocities.com/mmtty_rtty/
TrueTTY — Sound card RTTY w/ PSK31	www.dxsoft.com/mitrtty.htm
Pasokon SSTV programs & hardware	www.ultranet.com/~sstv/lite.html
PSK31 — Free — and much PSK info	http://aintel.bi.ehu.es/psk31.html
Interface for digital - rigs to computers	www.westmountainradio.com/RIGblaster.htm
Soundcard interface info — includes Alinco	www.packetradio.com/psk31.htm
Interface info for DIY digital hams	www.qsl.net/wm2u/interface.html
WinWarbler info and free download	www.qsl.net/winwarbler/
MFSK — related tech info — how it works	www.qsl.net/zl1bpu/
Throb — New — lots of info	www.lsear.freeserve.co.uk/ www.btinternet.com/~g3vfp/
Download Logger, also Zakanaka	www.geocities.com/kc4elo/
PSKGNR — Front end for PSK31	www.al-williams.com/wd5gnr/pskgnr.htm
Digipan — PSK31 — easy to use — new version 1.6	http://members.home.com/hteller/digipan/
TAPR — Lots of info	www.tapr.org
TNC to radio wiring help	http://freeweb.pdq.net/medcalf/ztx/
ChromaPIX and ChromaSound DSP software	www.siliconpixels.com
Timewave DSP & AEA (prev.) products	www.timewave.com
Auto tuner and other kits	www.ldgelectronics.com
XPWare — TNC software with sample DL	www.goodnet.com/~gjohnson/
RCKRtty Windows program with free DL	http://www.rckrtty.de/
HF serial modem plans & RTTY & Pactor	http://home.att.net/~k7szl/
SV2AGW free Win95 programs	www.raag.org/index1.htm
Source for BayPac BP-2M & APRS	www.tigertronics.com/
Int'l Visual Communication Assn. — nonprofit org. dedicated to SSTV	www.mindspring.com/~sstv/
Hellschreiber & MT63 & MFSK16 (Stream)	http://iz8bly.sysonline.it
HamScope — multimode w/ MFSK16	http://users.mesatop.com/~ghansen/
YPLog shareware log — rig control — free demo	www.nucleus.com/~field/

Table 1. The Chart.

THE DIGITAL PORT

continued from page 41

prepackaged unit. They just don't come out of the box to fit all our ham needs.

Throb

A brand new mode to most of us can be a lot of fun, if for no other reason than to do something we haven't done before. Lionel Sears G3PPT has been working on an innovative nine-tone MFSK system that shows a lot of promise.

I downloaded Throb (version 2.3 as I recall) some time back and had problems getting it to play. I knew other hams were actually using it to communicate, so I assumed some incompatibility in the computer here. Recent results seem to verify that line of thinking.

The current version 2.5 that is available at Lionel's Web page (see **Table 1**) and a few other places on the Internet works absolutely great. (See **Fig. 3**.) Of course, there is one problem. As of this writing, I am sure I have heard fewer than five Throb signals on the air.

In order to have a real, live test run, I engaged the help of Dave W9CGI. After chasing each other by known radio methods for a few hours one Saturday, we were able to conduct a flawless QSO on ten meters, which again, as of this writing, seems to be the band of preference. We hooked up at 28.078 and I was able to see how well this seemingly uncomplicated program tuned and performed.

The print never missed a beat. The mode is designed purposely to overcome weak signal and noisy conditions. Lionel describes his methods to achieve this goal in the accompanying files, and the only downside is that the throughput is a bit slow. This means that the hunt-and-peck typist has plenty of time to get his thoughts through the keyboard with no interruption in the transmitted text. Makes some of us look like good typists after all.

The program supports type ahead and has a few macros available. It takes just a few minutes to master the waterfall. I found it helped to increase (darken) the sensitivity of the waterfall to recognize signals easier. Once you find the other station's signal and center it in your waterfall, solid print seems inevitable.

There is only one problem with version 2.5, and I wrote to Lionel about it. The PTT does not work. I thought perhaps the DTR was not active on transmit, but it is simply a bug he is working on at this time. It will probably be fixed by the time this hits print. In any event, due to the slow throughput, I found there was plenty of time to reach over and manually toggle transmit on the rig. And that was the only problem — A real winner.

And ... speaking of Lionel ... here is a very fertile mind. He has practically perfected this Throb mode and is already headed down the road to another approach to the digital communications. I sighted a reference to a "CWMFSK" program that was supposed to be available from his Web site. There is some little mix-up there, because I went and looked and it wasn't available as yet. But ... again ... by the time you see this ... ?

Hellschreiber

For a long time, I did not take Hellschreiber seriously as a digital communications mode. I tried it a year or two ago and it worked. I was fascinated with what I saw, as it must have existed in a "pre-digital-history" era. Okay, so that is a little harsh. I realize that now, since I have spent a little more time with the IZ8BLY software for Windows.

I am not sure what prompted me, other than a little nudge by Murray Greenman, who has gained recent fame for the instigation of the MFSK16 mode. That, as many of you will recall, was developed also through a mighty effort by Nino IZ8BLY and incorporated in the Stream package, which is a free download (see **Table 1**).

What is of real interest is that there is more in the Hellschreiber package than plain-vanilla Hell. There are modified modes that deserve particular attention and experimenting. You will find that some of the modes are much superior for marginal path/weak signal conditions.

This is what I found, and how it came about. In addition to the default Feld Hell, there are six other versions available from the mode dropdown menu. My first recent contact with Feld Hell was not a disaster, but the print was very light at my end. I did not know the answer and the ham at the other end would have been quite lucky to have been able to convey the fix (for all I know, he did.)

So I went in search of answers. I signed up on the Hellschreiber reflector. Before I got around to posting a query on the problem, someone posted something like, "and by the way, if you are experiencing light print, turn up the receive audio drive." How simple can it get? I did that little trick.

However, there were no callers out there to answer their CQ nor hear mine after it was all "fixed." But I kept watching for other little clues as to how this mode could be considered so reliable in the long haul.

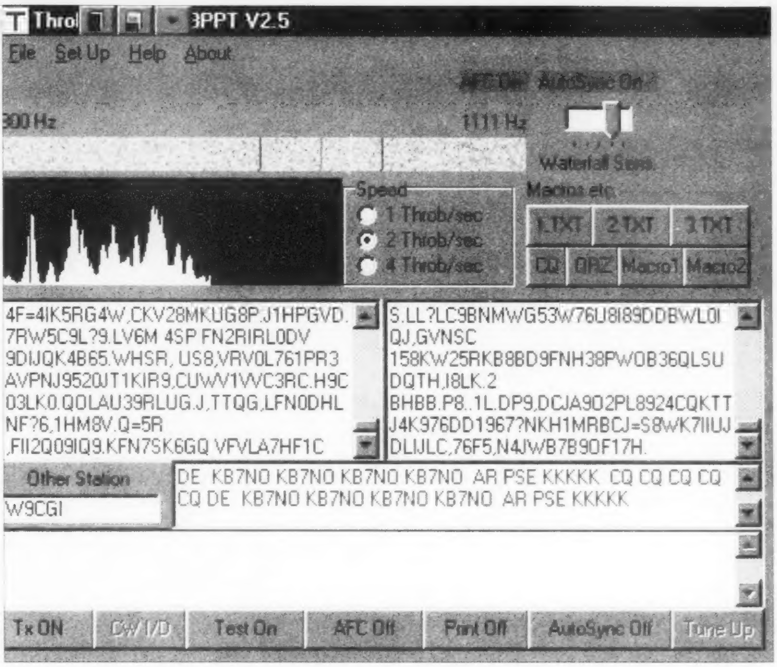
Another message came by off the reflector stating how much better FM Hell 245 baud handled the weak signal condition. "Very good," I am thinking: Now all I need is a live QSO to try some of these things.

Somebody heard me thinking apparently, because there was a posting that showed up about a quarterly Hell Activity Day that occurs again at the end of April. Very good — we will test these innovations during the flurry of activity that such an event promises.

As luck prevails at this home, I was available for maybe an hour during the specified Activity Period. Dutifully, I tuned around 14.062 and there was a Hell devotee in Nova Scotia, VE1CDD. Excellent copy, but there was suddenly some of that "contest" (?) QRM. I was able to watch JA5TX call me, and the print was interspersed with the VE1 signal. An interesting phenomenon for the uninitiated as I was.

JA5TX, Mitsu, who must be one of the main voices of Hell in Japan asked if I could switch to FM Hell 245 because the print was poor at his end. Another lesson confirmed. I did that and we were able to converse successfully for several go-arounds. And here I am hooked on yet another of these digital modes.

You just have to try it to see for yourself. Some excellent communication over the long haul, under adverse conditions, is being performed using the Hell modes, and most of us are ignoring it.



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AVPNJ952QJT1KIR9,CUWV1WC3RC.H9C
03LK0.Q0LAU39RLUG.J,TTQG,LFN0DHL
NF?6,1HM8V.Q=5R
,FII2Q09IQ9.KFN7SK6GQ VFVLA7HF1C
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QJ,GVNSC
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DQTH,I8LK.2
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DLIJLC,76F5,N4JWB7B90F17H.
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W9CGI

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DE  KB7NO KB7NO KB7NO KB7NO  AR PSE KKKKK  CQ CQ CQ CQ
CQ DE  KB7NO KB7NO KB7NO KB7NO  AR PSE KKKKK
```

Fig. 3. Throb screenshot. More fun —another new mode! And it is simple to operate. When you find a signal, it will traverse vertically through the waterfall in the top pane. I found it helped to move the Waterfall sensitivity to the right to darken the signal display. Once the signal is centered, the receive text will display in one of the panes that you see containing random characters. One, I understand is for LSB, the other USB. It is very straightforward and easy to use.

Alinco interface

A few days back, there was a posting on a ham reflector that made me think. It was a simple request for interface information, and I thought there would be plenty of answers. I took a quick look at the time and came away a bit puzzled. The interface was to an Alinco radio, and there are very few sites with that radio line covered.

I knew I had seen it somewhere, and when several days had gone by, I did a search and somehow came to familiar territory. A relatively complete source of wiring diagrams is available in the URL defined in The Chart as including "Alinco."

Editorial — What we have

I was talking to a ham the other day about all the different digital modes and all those innovations seemingly just over the horizon. I was remarking how I can't keep up and how it just doesn't seem possible that a ham of the current vintage could have an excuse (or the time) to go sit down in front of the television these days.

Speaking of the TV, I noticed a little blurb about some contract negotiations were going poorly and how, perhaps before this reaches you, the TV script writers will strike. Some journalist was remarking how "things would only get worse, etc." Perhaps there are some old Milton Berle or Ed Sullivan shows that could be rerun so that we could give today's viewers a real treat for their money. I watch so little of the current product of weird imagination that I would fare poorly at any trivia test on the subject. But enough of that, back to the serious business of ham radio. At least you and I have an alternative.

Just about when I had really given up on the upcoming crop of kids, I was talking to a ham who had bought his grandson a crystal set kit. He was telling me how the boy's eyes lit up when he heard it play the local AM station. Reminded me of a time when I was about that kid's age. (Okay, so all there was was AM)

Things don't really change just because there are hand-held game machines and the Internet for distraction. Science is still there, just waiting to be discovered — sometimes re-discovered is the correct approach. How much fun that is comes in the presentation of what can be done with simple components.

We still have, in ham radio, one of the close links to cutting-edge science and it is

Continued on page 57

Andy MacAllister W5ACM
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Houston TX 77083-5640

SUNSAT Sunset

With so many active amateur-radio satellites in the sky, the loss of one doesn't seem like a significant event, but it is. We are reminded that hamsats are a limited resource, and they do not last forever. In January, we lost one of the best LEO (Low Earth Orbit) birds.

On January 19, 2001, the ground station at the Electronic Systems Laboratory at Stellenbosch University in South Africa lost communications with SUNSAT-OSCAR-35. While there is always hope that communications can be restored, the university researchers and hams have announced that the only contact they expect to achieve is an occasional visual sighting via telescope. In a joint announcement from Professors Jan de Plessis and Arnold Schoonwinkel in early February, possible explanations for the loss of communications were proposed along with a synopsis of the recovery attempts.

Three possible scenarios have been proposed for the cause of failure. One is a simultaneous multipoint failure due to simple battery failure, solar-cell malfunction, and problems in the power regulation system. Next on the list is the possibility of a ruptured battery or a main-power-system diode failure. Finally, there is always the chance that there was a collision with an external object, causing major damage and leading to catastrophic events.

Many hamsats have outlived their computers and battery systems. AMSAT-OSCAR-10 is a perfect example. It is still in orbit today, 17 years after launch, providing communications via its Mode "B" (70 cm up and two meters down) transponder. The computer succumbed to radiation damage over a decade ago and the batteries no longer work, but the solar panels still provide power for the default transponder. In the case of SO-35, something drastic happened.

SO-35's active time in orbit lasted nearly two years. In the first year, solar illumination was optimum. The eclipse periods, during which SUNSAT was shadowed by the earth, were not a problem for the batteries and provided some periods of cooling. During its second year in space the satellite experienced five months of continuous illumination. This caused overheating and battery overcharging. The ground control station was forced to reorient the satellite in an attempt to counter these solar effects. When eclipsing resumed, it was noticed that the batteries were experiencing discharge problems during dark periods. The battery charge levels were cycled a number of times to diminish the effects of NiCd memory problems. Just before radio contact stopped on January 19th, telemetry indicated that all systems were working well. It was an unexpected event.

Controllers in South Africa used all possible combinations of the telecommand systems in their attempts to regain communications with SO-35. All failed. The ground station was tested with other hamsats for both uplink and downlink operations. No problems were noted with the terrestrial gear. Nothing was heard from the satellite, even during passes where the satellite was completely illuminated.

SUNSAT accomplishments

All of the original SUNSAT program goals were exceeded during its two-year lifetime. They included: providing new standards for amateur-radio satellite operation; demonstrating higher-resolution imagery from space than previously used on small satellites; stimulating graduate-level research development; fostering international science and engineering ties; and, finally, promoting educational efforts and technology in South African schools.

In the amateur-radio arena, hams were given a new and exciting analog/digital satellite. The "bent pipe" FM up-and-down voice transponder worked extremely well. The most popular voice mode was "B" with its 70-cm uplink and two-meter downlink. Even the cheapest HT or scanner could hear

***Photo A.** John WA5WOD and our hunting guide Abel get the horses ready.*

Photo B. *Andy W5ACM making contacts from "Base Camp One" at 10,000 feet (Grid = DM75ET, NE of Santa Fe, NM) via UO-14.*

Photo C. *Amazing — The Palm VII is getting Web access and E-mail from deep in the "back country" of New Mexico!*

the signals from SO-35, and the uplink was usually not as crowded as the other FM satellites, since the satellites schedule changed often due to university experiments.

For digital experimenters, the APRS (Automatic Position Reporting System) at 1200 or 9600 baud was intriguing. It was quite easy to set up a mobile rig to beacon live GPS (Global Positioning System) data through SUNSAT to other stations within the downlink footprint. This South African academic/amateur satellite proved an excellent proof-of-concept test bed for APRS-via-hamsat endeavors. You can find out more about SO-35's achievements via the SUNSAT Web site at [http://sunsat.ee.sun.ac.za].

Hunting for Hamsats

The loss of the FM repeater on SO-35 is significant, but we still have UoSAT-OSCAR-14 and AMRAD-OSCAR-27. With their two-meter uplink and 70-cm downlink Mode "J" transponders, lots of easy contacts are possible with simple gear.

Earlier last winter, I went hunting for elk with Bill WA5VQH and John WA5WOD in the mountains of New Mexico. Our hunting site was so remote that the only way in was to hike or pack in on horseback. We did both in our quest for big game. Bill provided the food, surplus MREs (Meals Ready to Eat). John brought the weapons, and we all brought plenty of cold-weather clothing. Our guide, Abel, supplied the horses.

I brought radios, antennas, GPS receivers, and my Palm VII PDA. In addition to its use as a satellite tracker and route mapper, the Palm VII also provided excellent E-mail communications from the back country. All of these radio toys only took up as much space as my digital camera and camcorder. Our trip was more than just a typical hunting expedition — it was also a great opportunity to go camping, experience some beautiful surroundings, experiment with ham radio, and visit.

It was evident that it would not be possible to catch as many satellite passes on this trip as we did on the family cruise to ports in Mexico during the summer of 2000. There were chores to do, and you can't ride a horse up the side of a mountain while attempting to tune a radio and orient an antenna for UO-14 or AO-27 contacts. Thus, most on-the-air activity was accomplished while in camp or back at the cabin.

The satellite radio was my Alinco DJ-580T with large 12 VDC battery packs for five watts output on 70cm. The antenna was the Pryme AL-800 telescoping dual-band whip. It collapses to 9.5" and telescopes out to 34". Since it is rigid, it is a bit unwieldy to use around people and trees, but makes up for that with its gain over shorter antennas. I also brought the usual earbuds and hand microphone to allow for easy full-duplex voice operation.

A few dozen contacts were made from the mountains northeast of Santa Fe, NM, with stations ranging from Canada to Mexico. Many folks got us for a new grid square and we had a lot of fun doing it. The GPS receivers helped us keep track of our location in the mountains and allowed me to ascertain our grid square from the cabin, base camp, and final hunting position. The Palm VII provided easy E-mail to friends and family that don't chase hamsats, and also gave us weather updates via its "Web clipping" feature using [weather.com]. Oh, yes: We got our elk!

New CD offering from AMSAT

At the AMSAT meeting last year, Russ Tillman K5NRK (AMSAT VP of Publications) proposed that AMSAT produce a CD containing back issues of *The AMSAT Journal.* Russ, volunteers, and contractors have worked to scan in six years of *The Journal* and produce a two-CD set. Adobe Acrobat was used to create PDF (Portable Document Format) files.

The AMSAT Journal typically runs about 32 pages and is printed bi-monthly for current paid AMSAT-NA members. The publication is printed in black and white on quality paper, but over the years has not been available in any electronic form.

When one of the two CDs is placed in the computer, the Autorun function starts up Acrobat Reader from the CD and displays the CD contents via a custom title page. Browsing through the back issues is simply a matter of point and click.

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Photo D. *Andy W5ACM, John WA5WOD, and Bill WA5VQH celebrate a successful elk and hamsat hunt atop Hamilton Mesa in New Mexico.*

THE DX FORUM

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Issaquah WA 98027-0538
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Changes in the Wind

OK. I heard ya. It's true. The relaxation of Morse code requirements has brought many newcomers to DXing. Many of you have said that the old-timers are turning a cold shoulder to you, and are reluctant to show you the ropes. Well, we're not going to do that here at 73 Magazine. *The beginner is welcome, and in the months to come you will see more features devoted to those who have just discovered the joys of DXing on the HF bands (and elsewhere, for that matter).*

That's not all that is going to be different here on the pages of *73*. I have had numerous discussions with fellow DXers, as well as *73* staff, concerning the right venue for providing our DX-enthusiast readers with information and features that will serve them in the months and years ahead. This discussion actually began back when we decided to bring a DX column back to our readers. Wayne had asserted correctly that the DX community "doesn't need another DX *news* column." There are a number of excellent columns being written today. Consider as well that nearly every DXer has access to the Internet these days, and that there are numerous bulletin services that are available via that medium. Consequently, DXers have almost real-time access to newsworthy items concerning DXpeditions and the like. We in the printed media are shackled by production cycles and editorial lead-times. When it comes to providing time-critical information, it is impossible to compete with the immediacy of on-line electronic media.

So what does that mean to the editor of the DX Forum? The message that I keep hearing from those who have graciously taken the time to correspond with me on this issue is that *73*'s coverage of DX should focus on three things:

1. High-quality printed reference and "how to" material for the great number of newcomers to DXing.
2. In-depth coverage of DXpeditions.
3. A more comprehensive approach to the human interest component of DXing.

In response to these recommendations I, and others at *73*, have decided that I will (a) focus my attention away from a monthly column; (b) devote my energies toward detailed feature articles, equipment reviews that approach the introduction of new equipment from an operational, rather than a purely technical perspective; and (c) encourage and mentor other authors to write about DXing. The DX Forum will become more of a quarterly feature in *73*, focusing entirely on the human element of our passion for chasing DX. Our readers will begin to see more in-depth articles on the world of DX from a number of authors. Starting as soon as possible, there will be many more new equipment review articles that highlight what you can expect from the fancy new toys that are hitting the market.

Oh, and as far as the newsworthy stuff is concerned, and I know I'm going to upset a few folks by saying this (and don't mean to), the best source of time-sensitive information these days is on-air nets, your local radio club, and on-line newsletters. In fact, I'm going to be so bold as to make a strong recommendation that you look into subscribing to Bernie McClenny's "Daily DX" bulletin service. He has cultivated what I think is just about the best network of information sources, and is devoted to keeping us up to date on a daily basis.

So there you have it. Let me know what you think of these sweeping changes. Yogi Berra once said that, "You don't know what you don't know." That certainly applies to me.

FO0AAA
Clipperton Island 2000
The Official DXpedition
A52A
Bhutan
2000
The Official DXpedition Video

Photo A. *New videos available from 9V1YC.*

New videos available from 9V1YC

If you are wondering about what life is like on the other end of the pileup, there are some excellent videos that are now available. One of my very favorite operators is Jim 9V1YC. He has certainly gotten around, as it were, and has produced some videos that provide a glimpse into the world of DX from the DXpeditioner's point of view. His latest offering is a chronicle of the A52A DXpedition that took place in 2000. Jim's tapes are high quality, and very informative.

Here's a little note from Jim:

Hi, everyone,

Apologies for the bandwidth, but since this is DX related and I've been bombarded

Photo B. *This is what I stare at when I'm chasing the big ones.*

Photo C. *Here is my "dB enhancer," a Henry 2k Classic X. I finally broke down and agreed with K7SS that life is indeed too short for QRP.*

with E-mail asking me "When is it gonna be ready?!", I figured this is the easiest way to hit everyone at once without going nuts searching my "in-box."

After a long wait, I'm happy to report that the A52A Bhutan video is now finished. If you've ever wondered what Bhutan is really like from the inside, or what it's like to be behind an opening-day pileup at the #2 most-wanted, then you might be interested in this one. Lots more pileups this time, but also plenty of scenery, people, music, and background info on this absolutely beautiful country. 60 minutes of fun. (And your QSO with A52A just might be in there, too.)

My home page has more info at [http://home.pacific.net.sg/~jamesb].

I hope you enjoy it.

73,

James 9V1YC

He provides them in both NTSC and PAL format. His price is $15 US, plus another $5 each for shipping. You may obtain them at the following:

James Brooks 9V1YC
70A, Duxton Road,
Singapore 089529
[http://home1.pacific.net.sg/~jamesb/hw2buy.htm]
[jamesb@pacific.net.sg]

And now the news … I just got this from Bernie W3UR:

DXCC Announces New 17-Meter Award

DXCC is pleased to announce the addition of a 17 Meter Single Band DXCC award. Applications for this award will be accepted beginning January 2, 2001. 17 Meter DXCC certificates will be dated but not numbered. 17 meter credits will also count toward the DeSoto Cup competition for the year 2001.

If you do not know what credits you have on 17 meters, you may contact DXCC for an update prior to applying. This will help avoid duplicates and additional costs. If you have Web access and can handle Adobe (.pdf) files, contact DXCC at [dxcc@arrl.org] for a copy of your record. If you do not have Web access, please send a note to DXCC along with $1.50 for postage or an SASE with $1.50 in postage. For further information, please contact DXCC at [dxcc@arrl.org].

Hamshack tours

Nobody believes me when I tell them that there are no towers at my QTH, and that I am not using some huge piece of aluminum overcast to punch pileups. So just for fun I thought I would employ editorial license, and send along a few photos from my own shack. Notice that my FT-1000D has a new

Continued on page 58

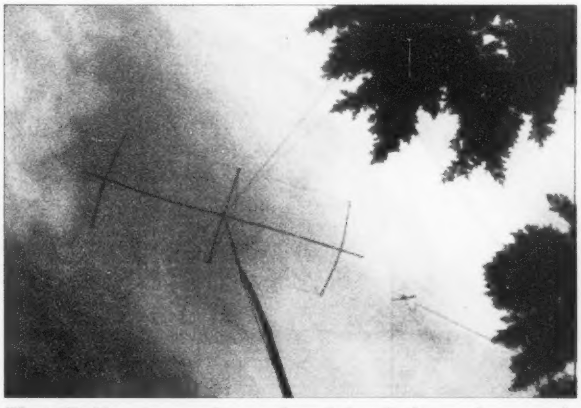

Photo D. *Here is one of my antlers. It is a 2-element beam made out of wire, PVC, and twine. It is hung from a rope catenary, and rotated from the ground. I will have an article on this thing in an upcoming issue of* 73.

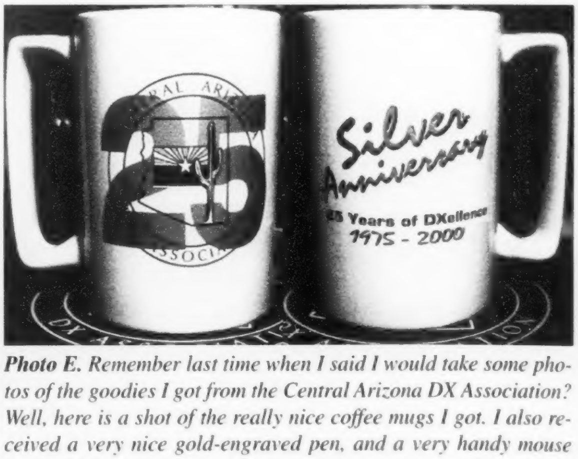

Photo E. *Remember last time when I said I would take some photos of the goodies I got from the Central Arizona DX Association? Well, here is a shot of the really nice coffee mugs I got. I also received a very nice gold-engraved pen, and a very handy mouse pad, which is in use as I prepare this month's column. Thanks again to my old friends at CADXA for the wonderful goodies.*

Steve Nowak KE8YN/0
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Springtime SkyWarn

As springtime approaches, we amateur radio operators find that we can once again provide some very worthwhile services to our communities. At this time of year, one of the most important services we can provide is through the SkyWarn program. SkyWarn provides eyes in the field for the National Weather Service during times of threatening weather. While amateur radio is a very important player in disaster recovery, SkyWarn provides a unique opportunity to provide service to help minimize damage, rather than to recover from it.

SkyWarn provides trained storm spotters. Unlike in the movie *Twister* (one of my personal favorites), we are not storm chasers, but spotting is a critically important service that should not be underrated. Essentially, SkyWarn spotters are able to provide additional information for meteorologists who are reading the data from their various instruments, remote stations, radar, etc. In other words, we provide the last piece of the puzzle to allow the meteorologists to better predict what is going to happen. More importantly, spotters can provide accurate and useful information coordinated through a network. This network ensures that the information will be provided in a logical and convenient manner to the meteorologists. This is one of the advantages of a network over having individuals contact the Weather Service via cellular telephone.

What are the elements of a successful SkyWarn operation? Since SkyWarn programs are managed locally, each may be slightly different, but there are certain common elements that contribute to the overall success of the effort.

1. SkyWarn operators are trained by the National Weather Service. There are several areas of training that are important to ensure the program's success. Although not every SkyWarn operator will function as a spotter, if at all possible, every operator should complete the SkyWarn spotter training program. This is usually conducted by National Weather Service meteorologists and is quite interesting for anyone with even a remote curiosity about weather. There are a number of observable phenomena covered in the program that are not intuitively obvious to everyone. The course is commonly taught in two sessions, with the second more advanced session building on the first. I cannot overemphasize how valuable and essential this training is. Besides, if you're looking for a relevant program for the local club meeting, here's one way to fill an open slot or two!

There are some key players in the SkyWarn team who may not be trained in storm spotting. Some of the most effective net control operators I've seen have been physically challenged. A blind ham I worked with could keep station locations and reports more accurately in his mind than I ever could with pen, paper, computer, etc. He was probably the best net control I ever saw.

2. SkyWarn operators are trained in net operations. It is important to know precisely what to say and when. It is more important to know when to say absolutely nothing. As hams we love to talk, but "fair weather" reports telling the entire net that nothing is happening at a particular location are counterproductive. They distract people and someone with relevant information must wait until the frequency is clear to transmit his report. SkyWarn nets normally should be operated as a directed net with all communications directed to the net control, and it's best if everyone is accustomed to this type of operation.

3. SkyWarn operators know how to communicate their information. The way we hams talk and the way meteorologists talk are not the same. If NWS is our customer, we need to provide the information they need in the manner they need it, not in the way we normally would present it. Key items they need to know about include lightning, abnormally heavy rain, high winds, hail, and rotational patterns.

- Lightning — Meteorologists need to know if it's cloud-to-cloud or cloud-to-ground. They also may need to know its frequency, either by number of strikes per minute or the average delay from one lightning flash to the next.
- Rain — It is best if we can describe rainfall accurately. If you have a rain gauge, then state that it is so many inches per unit of time and that you measured the rain. If not, you may describe when a street floods, or if the sewers are overflowing. Describe what you see rather than estimate.
- Winds — Unless you have a wind gauge, it's normally best to provide a factual description. This may include how far trees are moving and the size of the trees. Another good indicator is the direction of rain. If all the rain appears to be horizontal, that gives the meteorologists an idea as to wind speed.
- Hail — Hail is a very important indicator of vertical development of a storm. Generally, the more vertical the development, the more powerful the storm. The best description possible is obtained by actually measuring the hailstone size. If you can't, then describe it in relationship to a coin. Never describe hail as the size of a marble! There are marbles of all sizes, so this description is not only worthless, but a good way to frustrate your friendly neighborhood meteorologist.
- Rotational patterns — These, of course, are critical if conditions are conducive to the formation of tornadoes, and tornadoes can be a secondary event of other weather patterns such as hurricanes. Not all rotations are tornadoes, of course, as there are waterspouts and

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CALENDAR EVENTS

Listings are free of charge as space permits. Please send us your Calendar Event two months in advance of the issue you want it to appear in. For example, if you want it to appear in the June issue, we should receive it by April 30. Provide a clear, concise summary of the essential details about your Calendar Event.

APRIL 7

LONDONDERRY, NH The Interstate Repeater Society will hold their Spring Hamfest and Flea Market on Saturday, April 7th, at the Lions Club Hall on Mammoth Rd., RT 128, in Londonderry NH. Directions: I-93 to Exit 4. Go west on RT 102. Go right at lights just after Dunkin' Donuts. The hall is one mile on the right. Vendor setup 6 a.m.–8 a.m. Admission fee $10 at 6 a.m., $3 at 8 a.m. For table reservations, please call *Paul at (603) 883-3308;* or E-mail to *[K1LLX @juno.com]*. VE exams 9 a.m. to noon. Reservations suggested. For more info call *Bill at (603) 424-2857,* or E-mail to *[BILLS@ AA1OC.org]*.

APRIL 8

RALEIGH, NC The Raleigh ARS will host its 29th Hamfest and Computer Fair in the Jim Graham Bldg., NCS Fairgrounds, Sunday, April 8th, 8 a.m.–4 p.m. Wheelchair access. ARRL, MARS, ARES and NTS meetings will be featured. Pre-register for $5; $6 at the door. All activities inside. Tables and booths available. Free parking. RVs are welcome. There will be a hospitality party Saturday night. If you are interested in VE exams, call *W4VFJ at (919) 556-8551.* Contact *Hank Montgomery K4HM, 5045 Allanbrooke Ln., Fuquay-Varina NC 27526* for pre-registration and dealer info. Tel. *(919) 577-1254; E-mail [k4hm@arrl.net]*.

STOUGHTON, WI The Madison Area Repeater Assn. will host the "Madison Swapfest" on April 8th at Mandt Community Center, Stoughton Junior Fair Grounds, South Fourth St., Stoughton WI. Free parking. Doors open at 8 a.m. Talk-in on 147.15. Tickets $4 in advance or $5 at the door. Tables $12–$15 each. Contact *Madison Area Repeater Assn., P.O. Box 8890, Madison WI 53708-8890. Tel. (608) 245-8890. Web site [http://www.qsl.net/mara/]*.

APRIL 21

WEST ORANGE, NJ The Roseland Radio Club will present an Amateur Radio, Computer, SWLer, Electronic Hobbyist Hamfest, Saturday, April 21st, 8:30 a.m.–1 p.m. at the West Orange High School, 600 Pleasant Valley Way, West Orange NJ. Talk-in on W2QR rptr. system: 146.415(+1.0) 85.4T, 224.480(-1.6) no tone, 447.875(-5.0) 156.7T, and 146.520 simplex. Plenty of free parking. Ground level access. Admission $5 at the door. No advanced tickets. XYL/children under 12 free with regular admission. Advanced tables $12 for the first, $9 each additional; $15 for first table, $12 for each additional at the door. $2 for limited # with electric. Reservation deadline is April 11th. After that, first come first served. Sellers admitted at 6:30 a.m. Special vendor parking lot. VE exams courtesy of Nutley ARC. For more details contact *Jim Howe N2TDI or Liz Howe N2WGH, (973) 402-6066; E-mail [jimn2tdi@att.net]*. Club Web page is at *[www.qsl.net/k2gq]*.

APRIL 29

ARTHUR, IL The Moultrie ARK invites you to their 39th annual Hamfest. The event will be held at the Moultrie/Douglas County Fair Grounds on the south side of Arthur, just off Illinois Rte. 133, behind the school. Hours are 8 a.m.–1 p.m. Talk-in on 146.055/.655 and 449.275/444.275. Admission is $5 per person over the age of 14 years. Plenty of indoor space is available, but there are a limited number of tables. Tables are $10 each, paid in advance. To reserve tables, or for more info, contact *M.A.R.K, P.O. Box 91, Lovington IL 61937; or tel. days (217) 543-2178; eves. (217) 873-5287.*

CANFIELD, OH The 20/9 Amateur Radio Club, Inc., of Youngstown OH, will present its 17th Annual Hamfest, Sunday, April 29th, at Mahoning County Career and Technical Center (formerly J.V.S.), 7300 N. Palmyra Rd., Canfield OH, from 8 a.m.–2 p.m. Admission $5, children under 12 free with an adult. Mobile check-ins and directions until Noon on 147.315 and 443.225, with 145.275 for backup. Free parking. Handicap facilities available. Outdoor flea market space, $2 per 10 ft. section. Dealer/Flea market setup at 6:30 a.m. Inside tables, $10 per table, gate admission NOT included. Inside tables guaranteed until 9 a.m. with reservation fee in advance, others first come first served. Dealers, send registration with an SASE and check or m.o. payable to *20/9 Amateur Radio Cub, Inc., 55 S. Whitney Ave., Youngstown OH 44509.* Reservation deadline is April 15th. For more info, contact *Don Stoddard N8LNE, Chairman, 55 S. Whitney Ave., Youngstown OH 44509; tel. (330) 793-7072. E-mail [N8LNE1@juno.com];* or *Rich Hamaker, Co-Chairman, 4939 E. Radio Rd., Youngstown OH 44515, tel. (330) 792-4019.* Uniformed and plainclothes security will be present. Alcoholic beverages, firearms, and questionable or demoralizing materials, are not permitted on school property.

MAY 5

CADILLAC, MI The Wexaukee ARC will hold their 39th Annual Amateur Radio and Computer Swap Meet on Saturday, May 5th, from 8 a.m.–12 p.m. at the Cadillac Junior High School in Cadillac MI. Talk-in on 146.980/K8CAD rptr. Free parking. Admission is $5, tables $8 per 8 ft. table. VE exams at 10:30 a.m., by pre-registration only; contact *Alton NU8L (231) 862-3774* or E-mail *[amcconnell3@hotmail.com]*. For more info please write to *The Wexaukee ARC, P.O. Box 163, Cadillac MI 49601.*

CEDARBURG, WI The Ozaukee Radio Club will sponsor its 23rd Annual Cedarburg Swapfest, 8 a.m.–1 p.m. at the Circle-B Recreation Center, Hwy. 60 and County I (located 20 miles north of Milwaukee, west of Grafton). Admission is $4, both in advance and at the door. 4 ft. tables are $5 each (limited power available on request). Seller's setup 6:30 a.m. VE exams start at 9 a.m. Talk-in on 146.37/.97 and 146.52. For tickets, table reservations, maps, or additional info, send an SASE to *Gene Szudrowitz KB9VJP, ORC Swapfest Chairman, W55 N865 Cedar Ridge Dr., Cedarburg WI 53012. Tel. (262) 377-6792;* or *Skip Douglas at (262) 284-3271.*

MAY 5–6

ABILENE, TX The Key City ARC will sponsor the ARRL West Texas Section Convention and 16th annual Hamfest at the Abilene Civic Center from 8 a.m.–5 p.m. Saturday, and from 9 a.m.–2 p.m. Sunday. Free parking. VE exams. Wheelchair access. Limited RV parking for a nominal fee. Tables $7 each. Pre-registration $7 (must be received by April 30th), $8 at the door. Talk-in on 146.160/.760. For reservations and info contact *Peg Richard KA4UPA, 1442 Lakeside Dr., Abilene TX 79602. Tel. (915) 672-8889; E-mail [ka4upa@arrl.net]*.

SPECIAL EVENTS, ETC.

APRIL 21–22

RACHEL, NV The Silverdust ARA of Nevada (N7A) will operate from Rachel NV 2000Z April

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[http://www.homingin.com]

Foxhunting, from Melbourne to Nottingham

Today's newspaper has yet another article about how Americans love their cars, vans, and SUVs. Even two-dollar-a-gallon gasoline hasn't slowed us down. Ham operators have combined their love of radios and cars for decades. They fill their vehicles with gear so they can chat, work DX, and keep track of one another with APRS as they roll along.

Nobody loves to combine driving and ham radio more than mobile hidden transmitter hunters. A T-hunt (or mobile foxhunt as it's sometimes called) usually means an afternoon or evening in a vehicle full of radio direction finding (RDF) gear, trying to find one or more radio beacons that have been put in unlikely places by fellow hams. Some in southern California aren't content with such a simple format. Their "All-Day" (better named All-Weekend) hunts start on Saturday morning and can last well into Sunday.

Regular "Homing In" readers know all of this, but may not realize that mobile T-hunting is a favorite sport in some places outside of North America, too. I have corresponded with Japanese, Italian, and Mexican hams who like to do it and to talk about it. But for gung-ho enthusiasm and competitiveness, it's hard to surpass hams who call their car hood the "bonnet" and car trunk the "boot."

G'day, let's hunt!

If you're ever in Melbourne, Australia, on Friday evening, find out if there will be a radio foxhunt that night. If you participate, you're virtually guaranteed an unusual adventure. Before suppertime (which may be at midnight), you may have to find a dozen transmitters. Some will be plainly visible from your vehicle, but expect several of them to be cleverly camouflaged.

Team leaders draw lots for positions in the lineup of cars at the start point. Then the first fox drives off to plant the first transmitter. The hunters (called "hounds" Down Under) take off about 10 minutes later.

Odometer mileage means nothing on a Melbourne hunt. Your team, which typically includes as many hams as the vehicle will hold, has to be first to find each fox for best score. As soon as you find one, it's off to find the next one, and so on.

To save time on hunts where the fox is not right out on the road, back-seat team members jump out and take off on foot with hand-held "sniffers" when they think they are within rapid hiking distance of the fox. This practice is called "dropping runners." The front-seat hunters then continue, trying to drive closer if they can.

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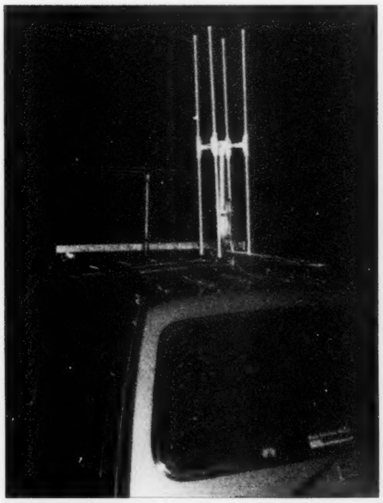

***Photo A.** The VK3GMZ team hunts on two meters with both a horizontally polarized beam and a modified marine doppler array. (Photo courtesy of Mark Diggins VK3JMD)*

***Photo B.** From the passenger seat, VK3CHR handles RDF gear for the VK3UT RDF team. Homebuilt RDF setups are the norm in Melbourne. (Photo courtesy of VK3JMD)*

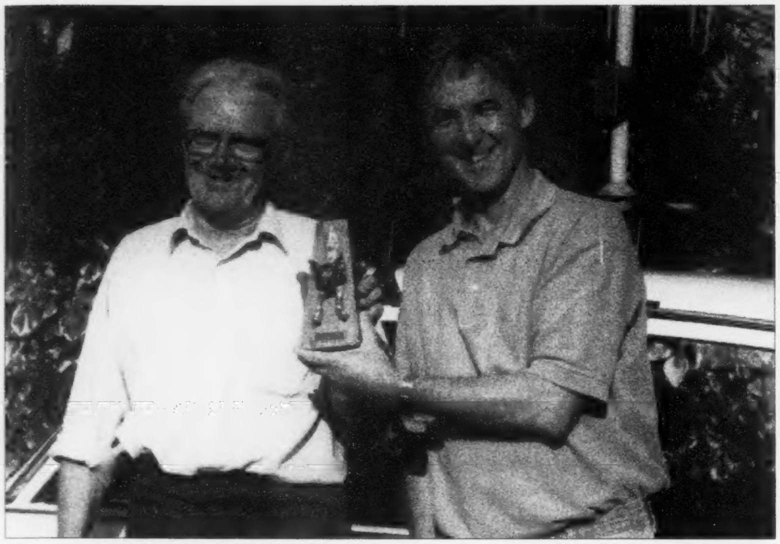

Photo C. John Wood G0PSI (left) and Dave Bullock G6UWO proudly display their ARCON foxhunting trophy. (Photo courtesy of Dave Bullock G6UWO)

HOMING IN

continued from page 51

The January 2001 Melbourne hunt was a good example of cunning and high tech. Here are some excerpts from the VK3YDF hiding team's report: "Five teams of hounds set off from a shopping center car park in Boronia. Bruce from the VK3YQN team was first to find the first fox hidden inside a blackberry bush between Burwood highway and the train line in Ferntree Gully.

"The second fox was behind a school in Ferny Creek. It was near the intersection of two 'roads' behind the school. Although marked on the map, they actually didn't exist at all. Several teams found their access blocked by rather large trees and impenetrable bush. Others found that one of the so-called 'roads' had a walking track near it, which provided easy access to the fox. The third signal led to a rail siding west of Upwey rail station. The fox had buried himself under foliage just above a concrete wall.

"Next was the main event for the evening, a two-hour multileg hunt. Eight transmitters were running on the same frequency. A number of different rates of transmission were used, ranging from continuous through various levels of intermittent. Each fox had a point score that increased the more intermittent the transmission.

Photo D. John and Dave's foxhunting vehicle with its motorized beam at a hilltop test site. (Photo courtesy of G6UWO)

"All eight foxes were programmed to switch on at 9:30 p.m. and off at 11:30 p.m. Each hound was given two keys consisting of a 6.5mm plug containing a pre-programmed microprocessor. When plugged into a socket on the fox, the code transmitted from the key recorded the first time that team's plug was plugged in, and also disabled the transmitter for 10 seconds. This gave a chance for the rest of the team to take bearings on other close-by foxes during the time the transmitter was disabled. Some foxes were sitting next to or at the end of roads, but were not visited by any hounds. On the other hand, some foxes were hidden on 'roads' that didn't exist.

"The supper hunt started at 11:30 p.m. with two foxes. Steve VK3YLE was parked in his car just above a disused quarry in Ferntree Gully. Adam VK3YDF was just below the same quarry operating on a handheld. While there was a very easy access to Steve's location, most teams chose another very steep and bumpy road to either arrive or depart from his location. Adam, who was barely 500 meters away from Steve, was quite surprised to see some teams drive within 50 meters of his location only to do a U-turn and head back up to Steve before trying again. The signal was apparently just not strong enough to be there!"

When I visited Down Under some years ago, most of the gear in almost every hamshack was home-built. For RDF at least, Aussies' love of do-it-yourself continues. Each team has developed its own creative collection of mobile hunting gear. Some setups are quite advanced, featuring motorized directional antennas, computers, and cathode-ray tube displays (**Photos A** and **B**).

"Sniffers" for on-foot hunting usually consist of a sturdy three-element yagi and a receiver with built-in attenuation. Some hunters replace the receiver's analog S-meter with a voltage-controlled audio oscillator and speaker. The pitch of the oscillator's tone goes up and down in proportion to the signal level. They call them "whoopee sniffers."

RDF intrigue in Merry Olde England

On the other side of the world, hams with similar accents hold similar transmitter hunts. Dave Bullock G6UWO of Nottingham, England, E-mailed to tell about his organization, the Amateur Radio Club of Nottingham. ARCON sponsors foxhunts throughout the year on the third Thursday of each month, from April through October.

As with the Australians, the ARCON fox is chosen by lot. Hunters' vehicles can have as many people inside as they want. G6UWO hunts with John Wood GØPSI (**Photo C**). In the club, there are some individual hunters and some cars that usually have four occupants.

The fox gives a one-minute transmission every 5 minutes, starting at 7:30 p.m. At 9:30, the fox location is revealed, along with the location of the pub where the hunters will then gather. The fox must hide within a 20-kilometer radius of the starting point and must be within 150 meters of a point accessible by a "normal family salon car."

Rules state that the fox may not be on private land, but an exception is made for private places normally used by the public. "Parking lots are OK," Dave says. "But there are many areas in Nottinghamshire that are privately owned, such as woods, country lanes leading to farms, and so forth. Some of these are ideal hiding places, but the owners get upset when hoards of people brandishing antennas come swarming over their property!"

Unlike the Aussies, these Brits have only one fox to find on a hunt night. That gives the fox team a big incentive to make that fox special. Automatic foxboxes are prohibited, so it's up to the ingenuity of the fox team to find a clever way to conceal both transmitter and operator. G6UWO's examples of recent hunts include these:

1. The fox dressed up as a fisherman by a river in the midst of a fishing competition. The transmitter was in his fishing basket-seat and the antenna was disguised as a fishing rod. Dave's comment: "Fishermen can be very serious!"

2. The fox dressed in "biker" gear in a Public House garden, sitting with other tough looking "bikers," all drinking. Dave's comment: "Extremely amusing, as hunters were very wary of approaching any of the leather-clad groups!"

3. The fox transmitter was under a major road intersection that had several levels of roads all crossing each other in a "spaghetti junction" type of layout. He was running 400 watts to a vertical antenna and gave an S9 signal 50 miles away. Dave's comment: "This really sorted those out with poor attenuators and leaky receivers. He actually melted the first antenna he tried!"

There's another example involving a "campervan" near other campers, with curtains drawn. Since this column is G-rated, you'll have to ask Dave about that one yourself!

A laptop in the nettles

I asked, "How can the fox transmit without his voice being heard by close-in hunters?" Dave replied, "He speaks very quietly! The hunters tend to arrive in ones and twos, so hearing the fox doesn't give much of an advantage. Usually, when you are able to physically hear him you have eyeball contact anyway. It is mainly the tricky hiding places with strange radiation reflections that tend to slow the hunters down."

Photo E. Dave adjusts the controls on the CRT readout of their "secret weapon." (Photo courtesy of G6UWO)

G6UWO went on to tell of a case where the rules were bent a bit. "The fox hid in tall stinging nettles at night under a camouflage-colored umbrella. His antenna was hidden in a tree directly under power lines to give a weird radiation pattern. He used a laptop and its sound card to time transmissions and play the audio. He put special sound effect backgrounds on his transmission to make him sound much nearer to a local main highway than he really was. It was pitch-black and pouring rain. Everyone was in the area, yet no one found him!"

Rules require vertical antenna polarization, nonvariable power of not less than 1 watt, and fixed antenna position. "This prohibits foxes from just using a handie-talkie

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TRANSMITTER LOCATION

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Remembering the "Drift-o-matic"

The HW-9 is a great QRP rig. Although it never reached the cult status of the HW-8, there are plenty of them still on the air. They have a good number of features and produce more than enough power to work the world..

And then there's the HW-9's forgotten half-brother: the HW-99. At first, I was not going to even talk much about this guy. The HW-99 is a Novice CW-only transceiver that operates on the 80, 40, 15, and 10 meter bands. It is really not a QRP radio, since the HW-99 will easily produce up to 50 watts output into a 50-ohm load. Most people looked at the HW-99 and determined it was featureless, expensive, and drifty. And they were right on all three counts. The HW-99 lasted only about a year and a half before Heathkit dropped it from their line. The HW-99 is housed in the same type of clamshell housing and sports the same two-tone brown color scheme.

The HW-99, a closer look

Running up to 50 watts input, the HW-99 can be adjusted down to QRP levels with a front panel drive control. I can get my HW-99 down to almost one watt with the drive control fully counterclockwise.

For some strange reason, I suspect cost savings, the HW-99's final transistors operate from a plus 30-volt VCC line. Hence, you can't add on an external 12-volt supply to operate the HW-99 in the field. For this reason, the HW-99 has its own built-in power supply. In fact, the butt end of the power transformer is exposed on the rear apron of the radio. It almost looks like the transformer was added on at the last moment, as the entire rear end of the chassis had to be cut out to hold the transformer.

The HW-99 features semi-break-in keying, but don't go too fast, as it keys very soft. The break-in delay is adjustable. The HW-99 has built-in sidetone, too.

The receiver is a single conversion superheterodyne design. There's a single crystal filter that supplies the bulk of the receiver's selectivity. A 450 Hz active audio filter provides the CW operator with enough bandwidth to listen to the tone, yet narrow enough to reject most nearby stations. The HW-99 does not have an internal speaker — you have to supply one yourself. There is a front-mounted phone jack, however.

There's a front mounted "S-meter" that uses a ten-segment LED bar. The strongest of signals will only light up five of the bars. This LED bar also displays relative output power. The key word here is "relative," since there is not a single mark on the panel to indicate any sensible meaning to the moving LEDs.

Since the HW-99 is a transceiver, there's an RIT control, which is kind of unusual for Heathkit. It provides about +/-2.5 kHz of travel.

Inside the HW-99

The HW-99 was built using three printed circuit boards. Like its little brother the

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Photo A. *Here's the HW-99, a CW-only Novice radio.*

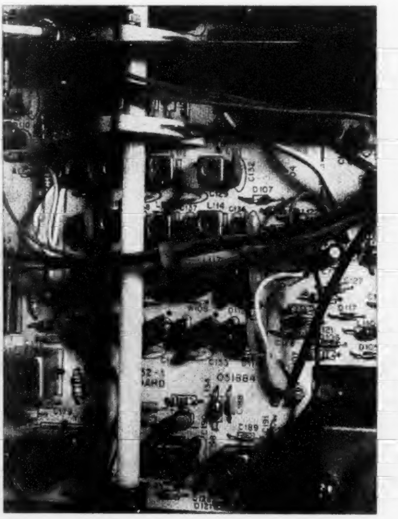

Photo B. *The transmitter bandpass filter adjustments are shown here. The bandswitch is shown going through to the rear filters.*

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$199⁹⁵
plus s&h

No RF Hash!

Switching Power Supply

They are fully protected with Over Voltage and Over Current protection circuits.

Worldwide Versatility

MFJ *MightyLites*™ can be used anywhere in the world! They have switchable AC input voltage and work from 85 to 135 VAC or 170 to 260 VAC. Replaceable fuse.

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Front-panel control lets you vary output from 9 to 15 Volts DC.

Front-panel has easy access five-way binding posts for heavy duty use and cigarette lighter socket for mobile accessories. MFJ-4245MV has two sets of quick-connects on the rear for accessories.

Brightly illuminated 3 inch meters let you monitor load voltage and current.

A whisper quiet internal fan efficiently cools your power supply for long life.

Two models to choose from . . .

MFJ-4225MV, $149.95. 25 Amps maximum or 22 Amps continuous. Weighs 3.7 pounds. Measures 5¾Wx4½Hx6D in.

MFJ-4245MV, $199.95. 45 Amps maximum or 40 Amps continuous. Weighs 5.5 pounds. Measures 7½Wx4¾Hx9D in.

NEW! 25 Amp *MightyLite*™

MFJ-4125
25 Amp
$109⁹⁵
plus s&h

Super light, super compact switching power supply delivers 25 Amps maximum/ 22 Amps continuous at 13.8 Volts DC. Low ripple, highly regulated. *No RF Hash!* Five-way binding posts for high current. Quick connects for accessories. Over voltage/current protection. 110 or 220 VAC operation. Meets FCC Class B regs. 3.5 lbs. 5½Wx2½Hx10¾D in.

MFJ 35/30 Amp Adjustable Regulated DC Power Supply

Massive 19.2 pound transformer . . . No RF hash . . . Adjustable 1 to 14 VDC . . .

MFJ Adjustable Regulated DC Power Supply

MFJ-4035MV
$149⁹⁵
plus s&h

MFJ's heavy duty conventional power supply is excellent for powering HF or 2 Meter/440 MHz transceiver/accessories.

A massive 19.2 pound transformer makes this power supply super heavy duty! It delivers 35 amps maximum and 30 amps continuous without even flexing its muscles. Plugs into any 110 VAC wall outlet.

It's highly regulated with load regulation better than 1%. Ripple voltage is less than 30 mV. *No RF hash* -- it's super clean!

Fully protected -- has over voltage protection, fold back short circuit protection and over-temperature protection.

You get front panel adjustable voltage from 1 to 14 VDC with a convenient detent set at 13.8 VDC. A pair of front-panel meters let you monitor voltage and current.

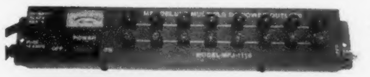
Three sets of output terminals include a pair of heavy duty five-way binding posts for HF/VHF radios, two pairs of quick-connects for accessories and a covered cigarette lighter socket for mobile accessories.

A front-panel fuse holder makes fuse replacement easy. Whisper quiet fan speed increases as load current increases -- keeps components cool. 9½Wx6Hx9¾D inches.

MFJ *High Current* Multiple DC Power Outlets

Power two HF/VHF transceivers and six or more accessories from your 12 VDC power supply

MFJ-1118
$74⁹⁵
plus s&h



MFJ-1116
$49⁹⁵
plus s&h

MFJ-1112
$34⁹⁵
plus s&h

New!
MFJ-1117
$54⁹⁵
plus s&h

MFJ-1118, $74.95. This is MFJ's most versatile and highest current *Deluxe Multiple DC Power Outlet*. Lets you power two HF and/or VHF transceivers and six or more accessories from your transceiver's main 12 VDC supply.

Two pairs of super heavy duty 30 amp 5-way binding posts connect your transceivers. Each pair is fused and RF bypassed. Handles 35 Amps total.Six pairs of heavy duty, RF bypassed 5-way binding posts let you power your accessories. They handle 15 Amps total, are protected by a master fuse and have an ON/OFF switch with "ON" LED indicator.

Built-in 0-25 VDC voltmeter. Six feet super heavy duty eight gauge color-coded cable with ring tongue terminals. Binding posts are spaced for standard dual banana plugs. Heavy duty aluminum construction. 12½x2¾x2½ in.

MFJ-1116, $49.95. Similar to MFJ-1118. No 30 amp posts. Has "ON" LED and 0-25 VDC voltmeter. 15 amps total.

MFJ-1112, $34.95. Similar to MFJ-1116. No on/off switch, LED, meter, fuse.

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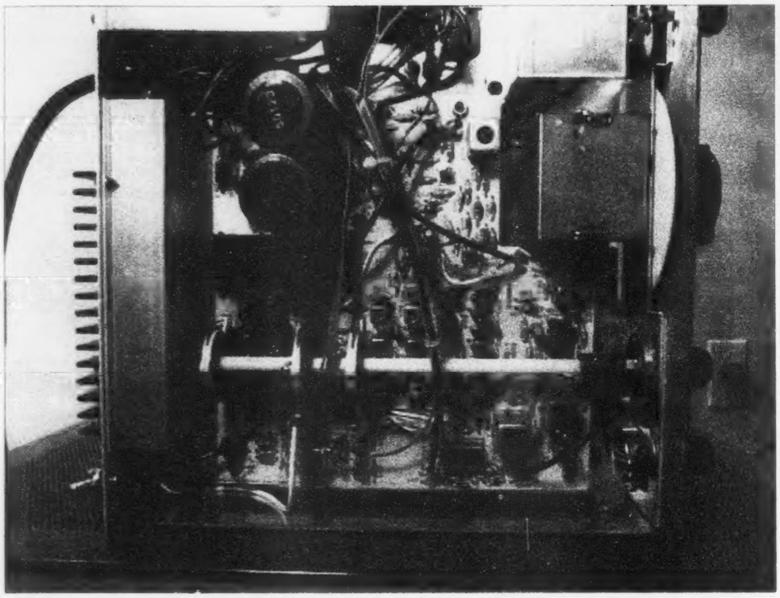

Photo C. *Inside the HW-99. This is the bottom board. Notice the final amplifier in the box mounted to the rear.*

HW-9, most of the receiver is on the top board and the transmitter, on the lower board. The final and those high voltage RF transistors are mounted in a shielded box mounted on the rear apron. What I find strange with the HW-99 is that the power supply is wired point-to-point using tie strips. The regulators are mounted to the chassis using ribbon cables and connectors.

Speaking of cables, there's a rat's-nest of wires going to and from the printed circuit boards. Many have sockets that are plugged into the circuit boards, while others are hard wired.

The VFO is mounted on the top PC board. The VFO's main components are mounted inside a metal can. The HW-99 uses a vernier drive to operate the VFO capacitor.

There's no 100 kHz calibrator. And that's a good thing, too, as there is no way to reset the dial. What you see is not really what you get. Don't waddle too close to the band edges when operating the HW-99.

The HW-99, a/k/a the "drift-o-matic"

Of all the radios I have owned, the HW-99 is by far the most drifty thing ever made. I am not talking about just drifting when turned on, but drifting up and down and all over the place and never really settling down. Heath knew about it. In fact, and I am not making this up, one of the final steps after you had assembled the HW-99 was to bake it in an oven set at 175 degrees. Really! The idea was to stabilize the VFO components so that they would not drift as much. There are instructions in the assembly manual telling you step-by-step how to set your oven correctly so you won't melt the plastic parts on the HW-99. Can the drift be fixed? Yes, as a matter of fact. There's an article in *QST* that describes a fix for the drifty HW-99. Check out the sidebar for more info.

Some of the fixes for a drifty HW-9 VFO can apply to the HW-99, as they are related. One method is to remove the coils from the VFO assembly and boil them in water for a few minutes. This "anneals" the wire and prevents drift. Another is to paint the inside of the VFO shield flat black. Since most of the drift is thermal, anything you can do to keep heat from interacting with the VFO components will help.

Operating the HW-99

There's not much to it. You dial up a station and close your CW key. The key

Continued on page 59

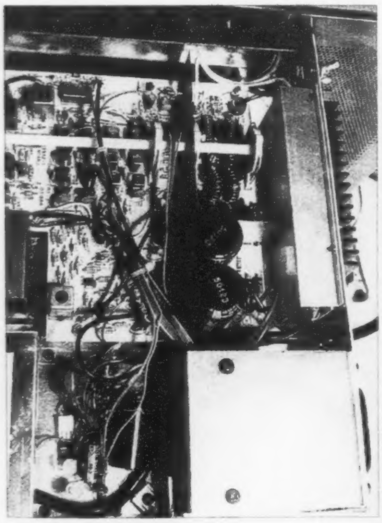

Photo D. *In the lower left corner, you'll see the voltage regulators and diodes for the power supply. The filter caps are mounted on the PC board.*

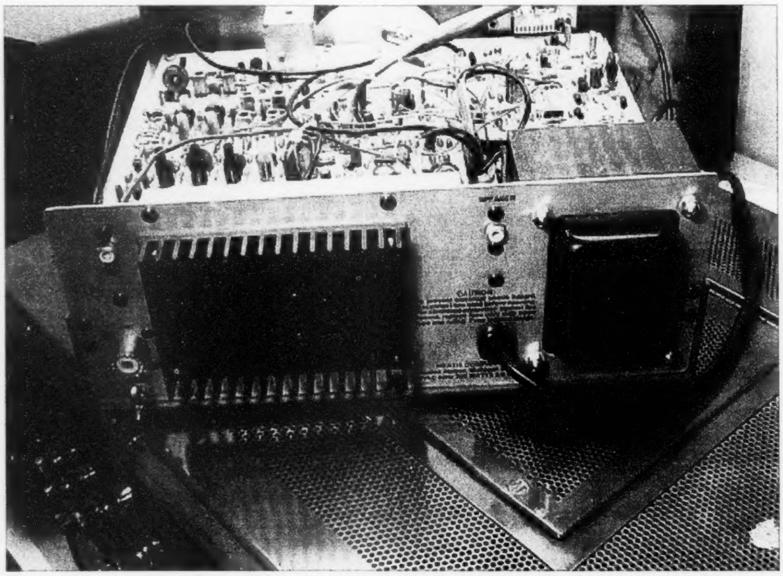

Photo E. *Here you see the final amplifier mounted to the rear apron. Notice the power transformer sticking out from the chassis.*

LETTERS

continued from page 8

without the clatter of a machine? Who would ever have thought it just a few years ago? But the smell of hot oil is missed!! And to communicate with someone on a bandwidth of 31 cycles. 3 QSOs in a 100-cycle band.

Then, of course, comes APRS — accurate positions to within 50 feet!!

Most of the guys with programming capability are making their discoveries available to the fraternity free as shareware. Some are trying to make money from their ham friends, but the majority of it is free and, for those charging, the next week another programmer will bring out a program that replaces the charged one for free. Some are using us as beta testers, which is GREAT.

Jack Heller, who writes for *73* magazine, has printed a table of all of the programs and list addresses for these various modes. One of the best SSTV programs (in my opinion) is still charging for their program, but there are also shareware ones available that enable you to work this mode.

Ham radio dead? Ham radio replaced by the Internet? I don't think so, if we get busy and educate the middle school–aged kids and up in what ham radio is all about. Now that "our" new satellite is up and the ISS is manned by all hams and both of these can be worked by a handie-talkie, what better way to show off ham radio?

I am still opposed to these crash courses being held on weekends to get a Tech license. It gives no one any opportunity to open the doors to what ham radio is really all about. Our course here in the high school will continue to be 10 weeks, and the persons attending will have a basic knowledge of electronics and the various modes of operation — but will be holding the key to experimentation. 73.

Arachnida Warcum

continued from page 17

Let's review its main points:

1. Very broadbanded.
2. Exceptionally quiet.
3. Low angle of radiation, even when close to ground.
4. No expensive, difficult-to-obtain parts.
5. High effectiveness-to-cost ratio.

And, you always get a great feeling when, in a ragchew, you say, "Antenna here is home-brew triband delta loop."

Carpe diem! Give it a try!

(Our condolences and thanks to Mac's XYL, Margery, who followed through in the publication process for this article after Mac became a silent key late last year. — ed.)

Way Cool Rocket Project

continued from page 22

I would like to formally thank the members of the Southern Area Rocketry Club in Atlanta GA for their help with launch operations for Sounding Rocket 101, Round 001.

THE DIGITAL PORT

continued from page 43

virtually in capsule form ... easily administered to what should be a ready and willing generation. We have not just another means of communication, but new ways to use radio and computer technology that were unheard-of just a few short years ago.

Most of the kids in their teens have no knowledge that ham radio exists, much less of what they could do with it. In days of yore, there were many careers fostered by an early interest in ham radio. Hams became technicians and engineers. Now, we have whole new directions where ham radio can help focus bright young minds.

In addition to what I write about there are satellite communications and, believe it or not, inventions still to be made. What we really need to do is to grab the interest of the youth and help direct that focus. It could just begin to lower the average age of hams ... such a thought!

If you have questions or comments about this column, E-mail me [jheller@sierra.net]. I will gladly share what I know or find a resource for you. For now, 73, Jack KB7NO.

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HAMSATS

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In order to do justice to the many photos and finely detailed schematics and engineering drawings, the scanning process created some rather large files, but it was worth it. While the photos may look a bit grainy on the computer screen at first, they show excellent detail when the Acrobat Reader "zoom" function is used, and they print well enough to compete with the original. The Acrobat OCR (Optical Character Recognition) function was invoked during production to create searchable text. This is extremely convenient when looking for all instances of a particular word or phrase within a selected year.

The release date is set to coincide with the Dayton Hamvention in May, 2001. You can get your set at the AMSAT booth. The cost/donation will be much cheaper for AMSAT members, but a program will be in place to encourage new memberships at the show. If you are not planning to attend Dayton, check with [Martha@amsat.org] or call (301) 589-6062 after May 21st to place an order. You'll be glad you did!

THE DX FORUM

continued from page 47

playmate. I was so excited about the TS-2000 that I ran down and got the first one to cross the border into the State of Washington. More about that toy coming up soon.

As for the antennas, all of my antennas are hung from ropes between the numerous 130-foot-tall "weeds" in my back yard. Actually, I'm on a couple of acres approximately 20 miles due east of downtown Seattle, and there are numerous Douglas firs, Pacific red cedars, and black cottonwoods on the property that make great antenna catenary supports.

Here's the equipment brag list.

Antennas: Numerous extended double zepps at 100 feet (80–17m); 2-element modified W8JK wire beam at 70 feet (15–6m); 1/4-wave wire vertical for 80m.

Transceivers: Yaesu FT-1000D; Yaesu FT-847 (in my office); Kenwood TS-2000K; Kenwood TM-D700A; Icom 706MKIIG (in the pickup).

Other hardware: Timewave DSP599zx; PII-400MHz confuser w/ 17" NEC Multisync monitor, running DX for Windows under Windows ME; PK232MBX; Nye-Viking Wattmeter; Henry 2k Classic X (loudenboomen mit spitz und sparken); MFJ -989C tuner; Heil Goldline 4 microphone; and a set of super-smooth, DX-enhancing Vibroplex iambic paddles

Well, that's enough showing off for me. Now you know what you're up against in the pileups.

Pulling the big switch

So much for this month's offering. Don't forget to drop me a line at [n6nr@arrl.net] and let me know what you think of the changes that will be coming down the road. You are welcome to contribute material — as a matter of fact, I strongly encourage it. See you in the pileups! 73 and good DX!

ON THE GO

continued from page 48

dust devils. When you take the SkyWarn training, you will learn about wall clouds. This is a very significant sign that should be immediately reported. (No, I'm not going to explain wall clouds — that's my sneaky way to get you to the SkyWarn course.) In any case, don't take it upon yourself to identify a questionable event as a tornado over the air. With people monitoring amateur frequencies, this can cause panic. Check with your NWS contacts as to what they recommend.

4. SkyWarn operations are organized. In SkyWarn, we are there to assist the Weather Service. This means that we need to understand what they need and organize our operation to meet those needs. Commonly, the NWS may wish to have a ham operator on site at the weather station. In many cases, there is an actual operating position for the SkyWarn operator. This means that the meteorologists can readily let him or her know what they need to find out. I have found it easiest to have a separate net control whenever possible. This lets the operator at the Weather Service concentrate on the meteorologists and the net control concentrate on the radio traffic.

I have a few more suggestions that may help your SkyWarn efforts. First, this is a great opportunity for clubs to work together. This may lead to some other shared service opportunities. Second, if you're looking for new hams among our school-age folks, mentioning SkyWarn may raise some additional interest. Third, be open to new ideas; APRS is becoming very popular in SkyWarn efforts. This allows the location of the storm to be indicated right on a computer-generated map. Fourth, SkyWarn presents a great opportunity to explain to your neighbors why those antennas in your back yard are a benefit to them. I always make sure to mention that I often know about the bad weather before the weather alert radios go off. For some reason, when the neighbors feel that those antennas may provide for their personal safety, they are much more supportive!

CALENDAR EVENTS

continued from page 50

21st–1900Z April 22nd, in celebration of the 5th Anniversary of the Extra Terrestrial Hwy. (NV State Hwy. 375), the gateway to the mysterious Area 51. Frequencies: 3.996, 7.260, 14.237, 21.371, 29.250, with some 6 and 2 meters. Map coordinates 115.47 by 37.40; grid square No. DM 27. Certificates will be sent upon receipt of a 9 x 12 SASE with two units of First Class postage. Send to *SARAN, P.O. Box 9717, Las Vegas NV 89191-0717 USA. Talk-in on 146.52. ETs, call home.*

HOMING IN

continued from page 53

with a rubber duck helical antenna," says Dave. "Of course, this doesn't mean that you can't put the antenna near power lines to distort the pattern, or have the antenna stuck in the ground down a river bank so all the RF shoots up and down the river's course.

"Nottingham is sited on the River Trent," Dave continues. "There are only two places to cross. The bridges are a long way apart either side of the city. It is a clever trick to hide by the river so hunters may choose the wrong bank. They then have a frustrating long drive around and can easily come in last whilst doing so!"

Point scores are awarded for placings in each hunt, and a team's best six of seven scores determine its year-end standing. So if you miss one hunt or do poorly on one, you still have a shot at the year's championship. Everybody can have a bad night now and then, as Dave relates: "On our last foxhunt of the season, we came in a pathetic fourth. We got a reasonable bearing from the start and dashed off, hoping to get a head start on the rest of the teams. The trail went cold for the next few transmissions and we got stuck behind every learner driver and old lady scared of third gear and giant snails!

"By the time we got a good bearing, we were a way off track and had to cut across country down twisty lanes in the pitch black. The fox was under a small river bridge amongst some derelict buildings in the middle of nowhere. He had a lot of nerve, as I wouldn't have considered that place in midsummer. Fortunately, we still had enough points in hand to give us the overall championship for a fifth season."

Every so often, a special hunt provides a change of pace. "G0PSI and I volunteered to be fox on the annual 430 MHz on-foot "fun hunt," Dave relates. "We really fooled the teams. The start is at the clubhouse, and we could hide within a one-mile radius. The single-story clubhouse has two large rooms and various smaller kitchen and janitor's rooms. On a club night, one room has the radio club and the other has a Scrabble club. We hid in the Scrabble club's kitchen, 20 paces away from the start.

"Running one watt to a 'slim-jim' antenna, there were reflections everywhere," he continues. "Only one team found us after an hour. I must admit to believing that everyone would be there in 20 seconds, but John won the day and was proved to be right. Lots of egg on faces, as most teams spent an hour and a half in the dark, frost, and rain wandering round the surrounding streets trying to make sense of the readings. Really funny!

"Hiding or hunting, we are still the team to beat," G6UWO proclaims. Partial credit for Dave and John's high scores goes to their unique RDF system, which includes a motorized yagi (**Photo D**) and associated bearing display unit (**Photo E**). In an upcoming "Homing In," G6UWO will disclose the details of this "secret weapon," which may inspire you to make one of your own. Meanwhile, keep the letters and E-mails coming. Addresses are at the beginning of this article.

QRP

continued from page 56

will switch a positive voltage to ground. Just about any electronic keyer will work. Key the radio and adjust the drive control until all the LEDs light. You don't want to run the drive at maximum; it won't produce any more RF to the antenna, but will generate lots of crud on your signal.

The active filter is kind of tight for my ears. The filter does not ring. The sidetone volume can be set to your liking.

That's about it for the HW-99. Like I said, it's not really a QRP radio, but it can easily be turned down to QRP power levels. It's drifty as hell and you can't operate it from a 12-volt battery at Field Day. Now, having said all of that, since Heathkit only produced the HW-99 for just a short time, they are very rare! Introduced at $299, I've seen them go for over $500 on e-Bay. If you see one, it would make a great addition to your Heathkit HW series of QRP radios.

QRX

continued from page 6

2. To carry this cola syrup (the concentrate), the commercial truck must use the hazardous materials place cards reserved for highly corrosive substances.

3. The distributors of this cola have been using it to clean the engines of their trucks for about 20 years!

Still want to drink up?

From the Internet.

NEVER SAY DIE

continued from page 4

agents were tipped by their pagers not to come to work that day. The ATF quickly denied this, claiming that one agent had been in an elevator with a DEA agent when the blast went off, and that the elevator fell five stories. They said the two agents then forced the doors open and rescued many survivors. The DEA agent, on the strength of this story, won the National Policeman of the Year Award for his heroism.

20/20 interviewed the elevator maintenance men, who said that the story was pure fantasy. They'd inspected the elevators after the blast and found them all in perfect condition. They said they couldn't possibly have fallen, as the ATF claimed.

As I've noted in a past editorial, one reader who is an expert on bombs said that a bomb made of the material (fertilizer) claimed would have created a horrendous stink, yet not one witness ever mentioned any smell. And what about the seismographs indicating there were two blasts, which many witnesses confirmed?

Well, we've recently seen TV investigative reports that the FBI did, indeed, use incendiary devices at Waco, though they denied it. They also denied shooting into the compound, yet we've now seen the flashes from their guns recorded on film from a helicopter over the compound.

Will we ever find out what the real story was in Oklahoma City? Hell, it's been over 60 years since Amelia Earhart disappeared and the government is still covering up the embarrassment of having recruited the most famous woman in the world as a spy.

Our government seems to classify information more to cover its own actions than to prevent it from getting into unfriendly foreign hands. And they wonder why more and more Americans are in fear of the government, and don't trust it.

We have the same endless cover-ups when it comes to UFOs and aliens.

Sure, I'm crazy for being convinced by overwhelming evidence that the Moon landings were faked. The true believers are convinced that we were able to send mission after mission to land on the Moon, even though 30 years later, when we have vastly more sophisticated systems, we've been unable to get most of our landers to Mars. Phooey.

Double-Blind Baloney

One of the most trusted scientific tests for medical procedures is the double-blind test, where neither the doctor nor the patient knows which of the test procedures is the test and which is the control. This test is so trusted by scientists

Continued on page 61

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Special DX Forecast

Due to seasonal improvements in ionization, April is historically one of the best months for the HF bands. When conditions go sour the VHF bands often perk up, so there is usually something you can work. However, overall DX conditions will still only rate a four or five on a scale of ten.

No intense geomagnetic disruptions are expected, but coronal holes, minor flares, and other solar events will continue to make regular HF communications challenging. The worst periods, as shown on the calendar, are likely to be the 6th through 8th, 14th and 15th, and 27th through 30th.

The best days often closely precede or follow the worst ones, and the 5th, 13th, 18th, 22nd, and 25th are my picks. In general, afternoons and evenings will provide the most openings when conditions aren't very good, especially if you're not looking for a particular contact.

Band-by-Band Summary

10/12 meters

Regular daytime opportunities early in the month, but expect their usefulness to dramatically decrease by the time May arrives. Openings will be to the east in the morning and to the west during the afternoon. Peaks occur in the afternoon, and you might try Africa just after midday for rarer contacts. Short-skip distances will fall between 1,000 to 2,500 miles.

15/17 meters

I expect these to be excellent, especially to the southern hemisphere. Signals peak before noon toward Europe, in Central and South America around midday, and to the west from late afternoon into the evening. Try long paths into the southern hemisphere to find unusual contacts. Short-skip will average around 1,000 miles.

April 2001

SUN	MON	TUE	WED	THU	FRI	SAT
1 F-P	2 F	3 F	4 F-G	5 F-G	6 F-P	7 P
8 F-P	9 F	10 F-P	11 F-P	12 F-G	13 G	14 F-P
15 P	16 F	17 F-G	18 G	19 F-G	20 F	21 F-G
22 G	23 F-P	24 F	25 F-G	26 F-G	27 F-P	28 P
29 F-P	30 F-P					

EASTERN UNITED STATES TO:

GMT	00	02	04	06	08	10	12	14	16	18	20	22
Central America	(15) 20	(15) 20	20 (40)	(20-40)	x	x	x	(10)	(10)	(10-15)	10 (17)	12-20
South America	(17) 20	20 (40)	20 (40)	(20-40)	x	x	x	(10)	(10)	(10-15)	10-15	10 (20)
Western Europe	(20-40)	(30-40)	(30-40)	(40)	x	x	(15-20)	(10-20)	(10)17	15-20	(15) 20	(20)
Southern Africa	(17) 20	(20-40)	(20)	(20)	x	x	x	x	(10)	10 (15)	12 (17)	(15-20)
Eastern Europe	x	(30-40)	(20-40)	(17-20)	(20)	x	x	(10-15)	(15)	(17-20)	(20)	(20)
Middle East	x	(20)	20	(20-40)	(40)	x	x	x	(10-15)	15	(17-20)	(20)
India/ Pakistan	(17-20)	x	x	x	x	x	x	(15-17)	x	x	x	x
Far East/ Japan	(17-20)	(20)	x	x	x	x	x	x	x	x	x	(15)
Southeast Asia	(17-20)	x	x	x	x	x	(17-20)	(10-15)	x	x	x	x
Australia	(15)	(17-20)	x	x	x	x	(20-40)	(20)	(10)	x	x	x
Alaska	(15) 20	(20)	(20-30)	(30-40)	(40)	x	x	x	(15-20)	(10-20)	(10)17	15-20
Hawaii	(15) 20	20	(20-40)	(20-40)	(40)	x	x	x	(15-20)	(10-20)	(10-20)	15-20
Western USA	15-20	20 (40)	20 (40)	(20) 40	(30-40)	x	x	(10-20)	10 (20)	10 (20)	10 (20)	(15) 20
CENTRAL UNITED STATES TO:												
Central America	(15-20)	20 (40)	20-40	20-40	(20-40)	x	(10-20)	10-20	10-20	10 (20)	10 (20)	10-20
South America	(15) 20	17-30	20 (40)	20 (40)	x	x	x	(10-20)	10 (20)	10 (15)	(10-20)	12 (20)
Western Europe	(20)	(40)	(40)	x	x	x	x	(15)	(15-17)	(15-20)	(17-20)	(20)
Southern Africa	20	(20)	(20)	(20)	x	x	x	x	(10)	(10-15)	(10-17)	(15-20)
Eastern Europe	(20)	(20)	x	x	x	x	x	(15)	(15-17)	(17-20)	(20)	(20)
Middle East	x	x	x	x	x	x	x	x	(15)	(15)	(20)	(20)
India/ Pakistan	(17-20)	(15-20)	x	x	x	x	x	(15-20)	x	x	x	x
Far East/ Japan	(17-20)	(20)	x	x	x	x	x	x	x	x	x	(15)
Southeast Asia	(15-20)	x	x	x	x	x	x	(20)	(10-20)	x	x	x
Australia	(15-20)	(20)	x	x	x	x	x	(15-20)	(15-20)	15	15	15 (20)
Alaska	15-20	(15) 20	20	20 (30)	(30-40)	(40)	x	x	x	(10-20)	10-20	10 (20)
Hawaii	15-20	(15) 20	20 (40)	(30-40)	(40)	x	x	x	x	(10) 12	10-15	(10) 17
WESTERN UNITED STATES TO:												
Central America	10-20	15-20	15-30	(14) 40	20-40	(30-40)	x	(15-20)	10 (20)	10 (20)	10 (20)	10 (20)
South America	(10) 20	(15) 20	20 (40)	20 (40)	x	x	x	(10-20)	10 (20)	(10-15)	10 (15)	10 (20)
Western Europe	x	x	x	x	x	x	x	x	(15-17)	(15-17)	(17-20)	(17-20)
Southern Africa	(20)	(20)	(20)	(20)	(20)	x	x	x	x	(10-12)	(12) 17	(15-20)
Eastern Europe	x	x	x	(17-20)	(17-20)	x	x	(15)	(15)	(15-17)	(17-20)	(20)
Middle East	x	(20)	(20)	x	x	x	x	x	(15-17)	(20)	(20)	(20)
India/ Pakistan	x	(17-20)	x	x	x	x	x	x	(15-17)	x	x	x
Far East/ Japan	10-20	(20)	x	x	x	(40)	(40)	x	x	x	x	(10-20)
Southeast Asia	(10-15)	(10-15)	x	x	x	x	x	x	x	(15-20)	(15-20)	(10-15)
Australia	(10-15)	(15)	(17-20)	x	x	x	x	x	(15) 20	(15-20)	(15)	(10)
Alaska	(10) 20	(15) 20	20 (40)	(20) 40	(30-40)	(40)	(40)	(40)	x	(10-15)	10-15	10-20
Hawaii	(15) 20	20	(20-40)	(20) 40	(30-40)	(40)	x	x	x	(10-20)	(10) 20	15-20
Eastern USA	15-20	20 (40)	20 (40)	(20) 40	(30-40)	x	x	(10-20)	10 (20)	10 (20)	10 (20)	(15) 20

Table 1. *Band, time, country chart. Plain numerals indicate bands which should be workable on Fair to Good (F-G) and Good (G) days. Numbers in parentheses indicate bands usually workable on Good (G) days only. Dual numbers indicate that the intervening bands should also be usable. When one number appears in parentheses, that end of the range will probably be open on Good (G) days only.*

20 meters

20 meters provides communications to most areas of the world when HF conditions are good, and is usually the place to look for openings when conditions are not so good. Peaks occur in the two hours after sunrise and just before sunset. The southern hemisphere should provide particularly strong DX signals. Short skip will fall between 500 and 2,500 miles.

30/40 meters

Probably your best choices from late evening until sunrise. The strongest and most frequent openings will be to the southern hemisphere, but atmospheric noise will increase as the subtropics heat up. The Middle East and Asia may provide some of your rarer contacts. Short skip will be under 1,000 miles during the day over 750 miles at night.

80/160 meters

These bands can provide some communications during the period from sunset to sunrise, but can't be relied upon with any regularity. Noise from storms really begins to limit openings at this time of year, but they're still worth investigating if 40 meters is open. Short-skip on 80 meters averages over 2,000 miles at night and around 300–400 miles during the day. Short-skip on 160 meters falls between 1,000 and 2,000 miles at night. 73

NEVER SAY DIE

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that billions of dollars of pharmaceutical money often depend on its validity.

Over 50 years ago, J.B. Rhine discovered that the double-blind test could be invalidated if the subjects ever were in the future apprised of the results. This unexpected discovery set Rhine back several years in his research. From then on, he had to set up his experiments so that the participants would never be made aware of the results.

This strange time phenomenon has more recently been confirmed by the Princeton PEAR Labs research.

It's something like morphic resonance, which has also been confirmed by researchers, as I've reported.

Yes, it's weird that just by my finding out what the answers are to a quiz a day or a year later will affect the way I answer the quiz questions. But then, we have plenty of evidence that time isn't just what we experience consciously. We know that researchers have confirmed beyond any question that precognition is a fact. Well, when we find out the answers to a test in the future, all it takes is some precognition to influence our answers.

So much for the scientific dependence on double-blind research.

Do Gooders

The campaign rhetoric over abortion and right-to-life is a triumph of emotion over reason. Phooey. Yes, I know, you are passionately in favor of the right-to-life. Or abortion rights. Well, shame on both your houses. First, this is a religious matter that our beloved courts have managed to get embroiled in. It's a case where one set of true believers wants to force another set to do as they believe, just because their belief is right.

We see examples of people killing to force their beliefs on others all around the world. Indeed, some right-to-lifers are willing to kill others to enforce their belief.

My question to the right-to-lifers is: Where were you when nearly a million people were slaughtered in Burundi not long ago? And what are your beliefs about the current slaughter in Rwanda? And about a dozen other African countries? Don't look away from me.

Either life is valuable or it isn't. Your silence over the deaths in Kosovo, Chechnya, Tibet, Sri Lanka, Burma, East Timor, and so on is deafening. I want to see some shred of evidence that you actually do care about life.

Americans twiddled their thumbs, eating popcorn and watching ball games while Stalin killed tens of millions of his people. Ditto Mao. Ditto Amin, and so on.

Oh, yes, you were smiling while the Iranians and Iraqis were at war, killing off a generation of their kids. Well, those kids aren't nearly as important as the teenage mother abortion of an American illegitimate, black, crack-crippled-for-life baby, right?

Reform? Har-de-Har

McCain made a fuss over campaign finance reform. That's a crock of campaign rhetoric.

First, if money didn't buy measurable, reliable results, big businesses and big unions wouldn't be spending tens to hundreds of millions of dollars to bribe Congress. Yes, of course they're bribes. And if the bribes weren't working, the money would quickly dry up and the thousands of lobbyists would be seeking other, possibly more honest, work.

Congressmen have to spend hundreds

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of thousands to millions to get elected and re-elected, so they *have* to accept the bribes, or they'll be forced to go back to their law firms.

Why do election campaigns cost millions? Because money buys votes. Like any war, the more arms your opponent has, the more you need to keep from being wiped out. So if your opponent for office buys newspaper, radio, and TV ads, you had damned well better do it too, or you're a dead duck on election night.

All politicians understand this situation. But they also know that the public is upset when they learn that millions are being spent to be elected, so they cater to this emotion, knowing that there isn't a chance in hell of any real change being made in the system.

It gets worse. The Republicans have a serious cross to bear, one which forces them to shake the money trees much harder than the Democrats. In the last election 89% of the media voted for Clinton. In practical terms this means that most reporters are going to be slanting their stories toward liberal candidates. There isn't even a remotely even playing field for the Republicans. And that goes for newspapers, magazines, radio, and TV.

One possible solution to this, if there were to be any interest in easing the problem, would be for Congress to pass a law which made it illegal for them to discuss on the floor or vote on any legislation where they might have a conflict of interest. Yes, I know, there's no way Congress is going to do anything which might slow down the cash flow, so that's just an empty proposal.

Unless …

Unless state legislatures passed state laws to that effect which would impact their Congressmen. And this is one reason why I've been asking the people who have read my three *Secret Guides* and benefited from them health- and wealth-wise to consider running for their state legislatures. With this leverage, they could effect Congressional finance reform, plus get busy cutting school costs, while enormously improving the educational product, and ditto health care.

Any candidates who talk about campaign finance reform are blowing smoke, and they knows it. They're lying because their pollsters told them this is a hot button with the voters.

Movies

Being thrifty, I go to the matinee performances at the fairly nearby cineplexes. Well, they're all of about a 45-minute drive, but that's the penalty of living on a farm not far from nowhere. With most of the movies not worth the trip, much less the ten bucks entry fee (for two), I don't go very often. But when Sherry and I do go, the theater seldom has more than a half dozen in the audience. Sometimes we're the only ones there!

Lordy, when I was a kid the nearest theater was just a few blocks away. It had two features and six acts of live vaudeville between the movies. I'm talking Pennsauken, New Jersey, not a city.

Later, when we moved to Brooklyn in 1933, I used to go to the movies on Saturday afternoon. For 10 cents they had two main features, a full-length western, two serials, six cartoons, the news, and they had drawings for prizes. I won a baseball mitt. The nearest theater was down at the corner, with six theaters within easy walking distance.

The evening movies were priced at 25¢. The theaters ran two main features, a cartoon, a newsreel, and the performances were continuous. The idea of a starting time for a movie wasn't even considered. We just went in and watched.

Unlike today's cineplexes, our theaters were huge, with a thousand or more seats, and they were usually packed every night, including the balcony. Often I'd have to stand at the back of the theater, watching for someone to get up and leave before I could get a seat. Then there was the race to get to it first. That was before popcorn and drinks had been invented. However, they did have a candy counter and Holloway's Milk Duds.

During my high school days I often took the subway to Coney Island, where I'd get a plate of fried scallops, lots of tartar sauce, and a plastic fork at Nathan's Famous, across the street from a theater. Nathan's was famous for their hot dogs, though at that time the Coney Island stand was all they had. Now I see Nathan's on Broadway and even at airports. Why are their hot dogs outstanding? The secret ingredient is nutmeg. Don't tell anyone. The stand was started by Nathan Handwerker in the 1920s and it's still going strong.

Coney Island was a fairly high-class amusement area until the 1939 World's Fair. The Fair drew away the people with money, so Coney Island had to lower its prices to attract poorer people, and it never recovered. The quality amusements gradually were driven out of business, leaving the area more like a cheap carnival, with a large black and Hispanic clientele. And it's filthy today.

TV sure has changed the movie business. I remember in 1948, when I bought an 8-inch RCA 630-TS black-and-white TV for $350. My mother thought it was a terrible waste of money—no one would bother watching it. It didn't take long before my dad was watching every western, wrestling, and so on. Soon my mother and dad were glued to the TV every night. I wasn't there at night because I was the chief cameraman at WPIX, channel 11. From there I graduated to being a producer-director in Dallas and then Cleveland, where I directed their network news program for all of Ohio. It was at about that time that I figured out that working for others wasn't the key to getting anywhere and started manufacturing loudspeaker enclosures.

You're probably old enough so the old movie theaters, with SRO, aren't news—but maybe, if you take your grandchildren in your lap and read this to 'em, the way my grandfather used to read to me, they'll enjoy this ancient history visit.

Goose Your Imagination

My *Secret Guide to Wealth* urges my readers to consider some field that sounds like a lot of fun and look for a job with a small company in that field, and then learn everything possible. But I'm getting letters from whiners saying they don't know what they're interested in. Good grief!

Continued on page 64

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The Bioelectrifier Handbook: This explains how to build or buy ($155) a little electrical gadget that can help clean the blood of any virus, microbe, parasite, fungus or yeast. The process was discovered by scientists at the Albert Einstein College of Medicine, quickly patented, and hushed up. It's curing AIDS, hepatitis C, and a bunch of other serious illnesses. The circuit can be built for under $20 from the instructions in the book. $10 (#01)

The Secret Guide to Wisdom: This is a review of around a hundred books that will help you change your life. No, I don't sell these books. They're on a wide range of subjects and will help to make you a very interesting person. Wait'll you see some of the gems you've missed reading. $5 (#02)

The Secret Guide to Wealth: Just as with health, you'll find that you have been brainwashed by "the system" into a pattern of life that will keep you from ever making much money and having the freedom to travel and do what you want. I explain how anyone can get a dream job with no college, no résumé, and even without any experience. I explain how you can get someone to happily pay you to learn what you need to know to start your own business. $5 (#03)

The Secret Guide to Health: Yes, there really is a secret to regaining your health and adding 30 to 60 years of healthy living to your life. The answer is simple, but it means making some difficult lifestyle changes. Will you be skiing the slopes of Aspen with me when you're 90 or doddering around a nursing home? Or pushing up daisies? No, I'm not selling any health products. $5 (#04)

My WWII Submarine Adventures: Yes, I spent from 1943-1945 on a submarine, right in the middle of the war with Japan. We almost got sunk several times, and twice I was in the right place at the right time to save the boat. What's it really like to be depth charged? And what's the daily life aboard a submarine like? How about the Amelia Earhart inside story?If you're near Mobile, please visit the Drum. $5 (#10)

Wayne's Caribbean Adventures: My super budget travel stories – where I visit the hams and scuba dive most of the islands of the Caribbean. You'll love the special Liat fare which let me visit 11 countries in 21 days, diving all but one of the islands, Guadeloupe, where the hams kept me too busy with parties. $5 (#12)

Cold Fusion Overview: This is both a brief history of cold fusion, which I predict will be one of the largest industries in the world in the 21st century, plus a simple explanation of how and why it works. This new field is going to generate a whole new bunch of billionaires, just as the personal computer industry did. $5 (#20)

Cold Fusion Journal: They laughed when I predicted the PC industry growth in 1975. PCs are now the third largest industry in the world. The cold fusion ground floor is still wide open, but then that might mean giving up watching ball games. Sample: $10 (#22).

Julian Schwinger: A Nobel laureate's talk about cold fusion—confirming its validity. $2 (#24)

Improving State Government: Here are 24 ways that state governments can cut expenses enormously, while providing far better service. I explain how any government bureau or department can be gotten to cut it's expenses by at least 50% in three years and do it cooperatively and enthusiastically. I explain how, by applying a new technology, the state can make it possible to provide all needed services without having to levy *any* taxes at all! Read the book, run for your legislature, and let's get busy making this country work like its founders wanted it to. Don't leave this for "someone else" to do. $5 (#30)

Mankind's Extinction Predictions: If any one of the experts who have written books predicting a soon-to-come catastrophe which will virtually wipe most of us out are right, we're in trouble. In this book I explain about the various disaster scenarios, like Nostradamus, who says the poles will soon shift (as they have several times in the past), wiping out 97% of mankind. Okay, so he's made a long string of past lucky guesses. The worst part of these predictions is the accuracy record of some of the experts. Will it be a pole shift, a new ice age, a massive solar flare, a comet or asteroid, a bioterrorist attack? I'm getting ready, how about you? $5 (#31)

Moondoggle: After reading René's book, *NASA Mooned America*, I read everything I could find on our Moon landings. I watched the videos, looked carefully at the photos, read the astronaut's biographies, and talked with some of my readers who worked for NASA. This book cites 25 good reasons I believe the whole Apollo program had to have been faked. $5 (#32)

Classical Music Guide: A list of 100 CDs which will provide you with an outstanding collection of the finest classical music ever written. This is what you need to help you reduce stress. Classical music also raises youngster's IQs, helps plants grow faster, and will make you healthier. Just wait'll you hear some of Gotschalk's fabulous music! $5 (#33)

The Radar Coverup: Is police radar dangerous? Ross Adey K6UI, a world authority, confirms the dangers of radio and magnetic fields. $3 (#34)

Three Gatto Talks: A prize-winning teacher explains what's wrong with American schools and why our kids are not being educated. Why are Swedish youngsters, who start school at 7 years of age, leaving our kids in the dust? Our kids are intentionally being dumbed down by our school system — the least effective and most expensive in the world. $5 (#35)

Aspartame: a.k.a. NutraSweet, the stuff in diet drinks, etc., can cause all kinds of serious health problems. Multiple sclerosis, for one. Read all about it, two pamphlets for a buck. (#38)

One Hour CW: Using this sneaky booklet even *you* can learn the Morse Code in one hour and pass that dumb 5wpm HF entry test. $5 (#40)

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Reprints of My Editorials from *73*. Very few things in this world are as we've been taught, and as they appear. I blow the whistle on the scams around us, such as the health care, our school system,. our money, the drug war, a college education, sugar, the food giants, our unhealthy food, fluorides, EMFs, NutraSweet, etc.

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Stuff I didn't write, but you need:

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The *73* Flea Market, Barter 'n' Buy, costs you peanuts (almost)— comes to 35 cents a word for individual (noncommercial!) ads and $1.00 a word for commercial ads. Don't plan on telling a long story. Use abbreviations, cram it in. But be honest. There are plenty of hams who love to fix things, so if it doesn't work, say so.

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This is a monthly magazine, not a daily newspaper, so figure a couple months before the action starts; then be prepared. If you get too many calls, you priced it low. If you don't get many calls, too high.

So get busy. Blow the dust off, check everything out, make sure it still works right and maybe you can help make a ham newcomer or retired old timer happy with that rig you're not using now. Or you might get busy on your computer and put together a list of small gear/parts to send to those interested?

Send your ads and payment to: *73 Magazine*, Barter 'n' Buy, 70 Hancock Rd., Peterborough NH 03458 and get set for the phone calls. The deadline for the June 2001 classified ad section is April 10, 2001.

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NEVER SAY DIE

continued from page 62

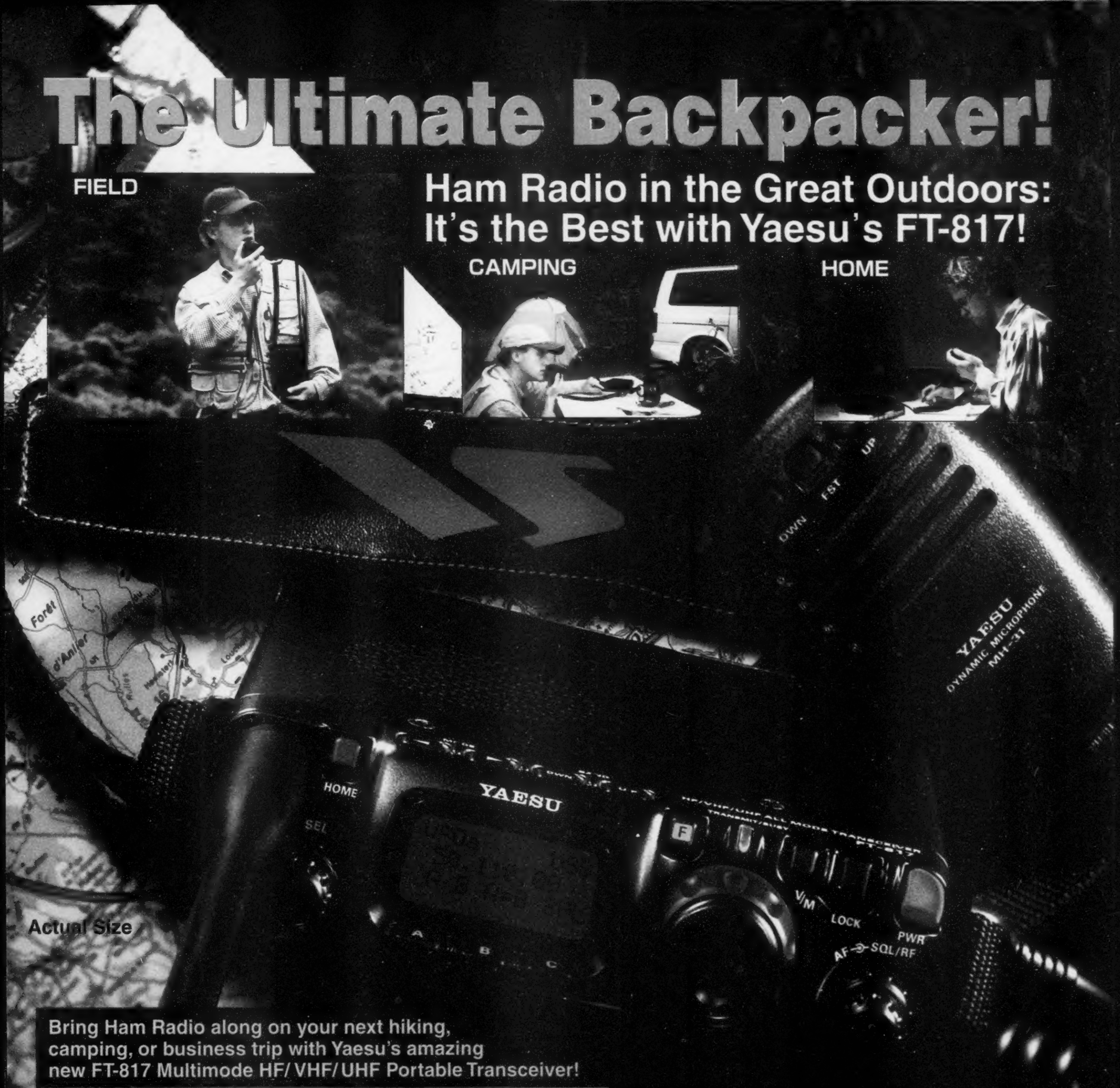
All you have to do is open your eyes and look around! For instance, if you've been reading my editorials you know that there is a growing need for day care centers as women are forced by today's prices to keep on working instead of staying at home, caring for their babies. Next time, I'll tell you (among other things) how to become a day care mogul.

First Avian QSO

At press time, reports were reaching *73* that the first legal avian QSO was scheduled to take place between 9M6's "Will the Bill," shown on our cover, and Abe Prull FØOL on ... er ... April 1st.

The Ultimate Backpacker!

Ham Radio in the Great Outdoors: It's the Best with Yaesu's FT-817!



Bring Ham Radio along on your next hiking, camping, or business trip with Yaesu's amazing new FT-817 Multimode HF/ VHF/ UHF Portable Transceiver!

● ULTRA COMPACT: Measuring just 5.3" x 1.5" x 6.5" WHD (135 x 38 x 165 mm) and weighing about 2 1/2 pounds (1.17 kg. including the supplied antenna and alkaline cells), the FT-817 is small and light enough to take along wherever you're going.

● WIDE FREQUENCY COVERAGE: 160-10 meters on HF, plus the 50, 144, and 430 MHz Amateur bands. Plus FM Broadcast, AM Aircraft, and Public Safety receiver coverage.

● MULTIMODE DESIGN: Ready for action on SSB, CW, AM, FM, FM-Wide (Rx), 1200/9600 bps Packet, and Digital, including dedicated USB and LSB PSK-31 configurations.

● 5 WATTS POWER OUTPUT: Using a new-technology all-band MOS FET power amplifier, the FT-817 provides 5 Watts of power output when using a 13.8 Volt DC source. When using Alkaline batteries or the optional FNB-72 Ni-Cd Battery Pack, power is automatically set to 2.5 Watts; via Menu, this can be changed to 0.5 Watt, 1 Watt, or up to 5 Watts.

● WIDE CHOICE OF POWER SOURCES: The FT-817 is equipped with an alkaline "AA" cell battery case, and a 13.8 volt DC cable is also supplied. Available as an option is the FNB-72 Ni-Cd Battery Pack (9.6 V, 1000 mAh), which can be recharged using a 13.8 Volt power supply while the radio is being operated.

● TWO ANTENNA PORTS: A "BNC" connector is provided on the front panel, and a type "M" connector on the rear panel, with Menu selection of which connector will be assigned for operation on HF, 50 MHz, 144 MHz, and 430 MHz.

● OPTIONAL 10-POLE COLLINS MECHANICAL FILTERS: An optional filter slot is provided, accommodating either the YF-122S (2.3 kHz) SSB filter or the YF-122C(500 Hz) CW filter. You get "base station" performance even from a mountain top.

● INCREDIBLE MEMORY RESOURCES: You get a total of 208 memories, including 200 "regular" memories which may be separated into ten groups of up to 20 channels each. And you can append an Alpha-Numeric "Tag" to each memory to aid in channel identification.

● A CW OPERATOR'S DREAM MACHINE: You get a built-in Electronic Keyer with adjustable weighting, adjustable CW Pitch, CW Normal/Reverse frequency tuning, and you can even use the microphone's UP and DOWN keys to send CW via the Keyer.

● BUILT-IN CTCSS AND DCS: The built-in CTCSS and DCS Encoder/Decoder systems provide you with the versatility you need for repeater access or selective calling.

● DUAL-COLOR LIQUID CRYSTAL DISPLAY: Select from Blue or Amber display illumination, which can also be switched off to conserve battery life. And while you're away, the Spectrum Scope will provide you with a visual record of activity ±5 channels from your current operating frequency.

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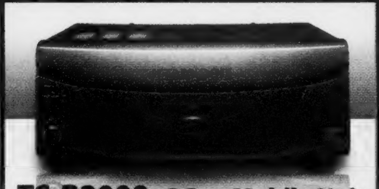

TS-B2000 **PC or Mobile Unit**

Brochure & Operators Manual Available at our Website

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RC-2000
Compact Mobile Head

The all new Kenwood **TS-2000** series transceiver offers today's demanding Amateur operator high performance operation without the compromising limitations found in other similar multi-band, multi-mode transceivers. The **TS-2000** offers three distinct operation platforms, the traditional transceiver with full function front panel, or the high-tech looking "silver box" version that allows mobile operation with the new **RC-2000** compact control head, or the ARCP-2000 computer control program making the **TS-B2000** functional from your personal computer. The new **TS-2000** offers 100 watts on HF, 6 meters and 2 meters, 50 watts on 70cm. **TS-2000X** will also include 1.2GHz. (available March 2001) You will be happy to know the **TS-2000** is transverter frequency display function ready to work the latest satellite frequencies available.

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